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Disclaimer:

Spent Nuclear Fuel and Reprocessing Waste Inventory

Spent Fuel and Waste Disposition

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This is a technical report that does not take into account contractual limitations or obligations under the Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (Standard Contract) (10 CFR Part 961). For example, under the provisions of the Standard Contract, spent nuclear fuel in multi-assembly canisters is not an acceptable waste form, absent a mutually agreed to contract amendment.

To the extent discussions or recommendations in this report conflict with the provisions of the Standard Contract, the Standard Contract governs the obligations of the parties, and this report in no manner supersedes, overrides, or amends the Standard Contract.

This report reflects technical work which could support future decision making by DOE. No inferences should be drawn from this report regarding future actions by DOE, which are limited both by the terms of the Standard Contract and Congressional appropriations for the Department to fulfill its obligations under the Nuclear Waste Policy Act including licensing and construction of a spent nuclear fuel repository.

SUMMARY

This report provides information on the inventory of spent nuclear fuel (SNF) in the United States located at Nuclear Power Reactor (NPR) and Independent Spent Fuel Storage Installation (ISFSI) sites, as well as SNF and reprocessing waste located at U.S. Department of Energy (DOE) sites and other research and development (R&D) centers. Actual or estimated quantitative values for current inventories are provided along with inventory forecasts derived from examining different future nuclear power generation scenarios. The report also includes select information on the characteristics associated with the wastes examined (e.g., type, packaging, heat generation rate, decay curves).

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TABLES

ACRONYMS

ATR	Advanced Test Reactor
BFC	Bare Fuel Cask
BWR	Boiling Water Reactor
DOE	Department of Energy
EIA	Energy Information Administration
GTCC	Greater-than-Class-C (category of radioactive waste)
GWd/MT	Gigawatt-days per Metric Ton (of Initial Uranium)
GWSB	Glass Waste Storage Building
HIP	Hot Isostatic Pressing
HLW	High-Level Radioactive Waste
INL	Idaho National Laboratory
ISF	Interim Storage Facility
ISFSI	Independent Spent Fuel Storage Installation
LLRW	Low-Level Radioactive Waste
LWR	Light Water Reactor
MCO	Multi-Canister Overpack
MT	Metric Tons
MTHM	Metric Tons Initial Heavy Metal (typically equivalent to MTU)
MTU	Metric Tons Initial Uranium
NIST	National Institute of Standards and Technology
NNPP	Naval Nuclear Propulsion Program
NPR	nuclear power reactor
NRC	Nuclear Regulatory Commission
NSNFP	National Spent Nuclear Fuel Program
OCRWM	Office of Civilian Radioactive Waste Management
ORNL	Oak Ridge National Laboratory
PWR	Pressurized Water Reactor
R&D	Research and Development
SFD	Spent Fuel Database
SFWD	DOE's Office of Spent Fuel and Waste Disposition
SNF	Spent Nuclear Fuel
SRNL	Savannah River National Laboratory

SRS	Savannah River Site
TREAT	Transient Reactor Test Facility
TMI	Three Mile Island
TRU	Transuranic
UFDC	Used Fuel Disposition Campaign
WEST	Waste Encapsulation and Storage Facility
WTP	Waste Treatment Project

SPENT NUCLEAR FUEL AND REPROCESSING WASTE INVENTORY

1. INTRODUCTION

This report[a] provides information on the inventory of spent nuclear fuel (SNF) and high-level radioactive waste (HLW)[b] in the United States. Inventory forecasts for SNF were made for a few selected scenarios of future nuclear power generation involving the existing reactor fleet, as well as reactors under construction for one case. This introductory section (Section 1) provides an overview of the SNF inventory based on three location categories: Nuclear Power Reactor (NPR) and Independent Spent Fuel Storage Installation (ISFSI) sites, DOE sites, and other research sites (universities, other government agencies, and commercial research centers). Section 2 presents more detailed information on the SNF located at NPR and ISFSI sites (excluding DOE ISFSIs). A more in-depth discussion on the SNF located at DOE sites is provided in Section 3. Research and Development centers are discussed in Section 4. Reprocessing waste located on government-owned (federal or state) sites is provided in Section 5. Additional and supporting information is contained in the appendices, namely information on NPR SNF characteristics; SNF discharges by reactor; and inventory forecast breakouts by reactor, storage location, site, state, U.S. Nuclear Regulatory Commission (NRC) region, and Congressional Districts. This report was sponsored by DOE's Office of Spent Fuel and Waste Disposition (SFWD) within the Office of Nuclear Energy and has been generated for SFWD planning and analysis purposes.

[a] This is a technical report that does not take into account contractual limitations or obligations under the Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (Standard Contract) (10 CFR Part 961). For example, under the provisions of the Standard Contract, spent nuclear fuel in multi-assembly canisters is not an acceptable waste form, absent a mutually agreed to contract amendment.

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[b] This report does not necessarily reflect final classifications for the material being discussed; for example, material referred to as "HLW" or "SNF" may be managed as HLW and SNF, respectively, without having been actually classified as such for disposal.

1.1 Inventory Summary

As of the end of 2020, the U.S Inventory of SNF and primary reprocessing waste is located at over 100 sites in 39 states. These locations include: NPR and non-DOE ISFSI sites; DOE sites; and other Research and Development Centers. Figure 1-1 provides the approximate locations for:

- Commercial NPR and ISFSI[c] Locations including;
    - 94 operating nuclear power reactors (see Table 2-1),
    - 25 shutdown nuclear power reactors (See Table 2-1),
    - 1 away-from-reactor NPR SNF pool storage facility (see Table 2-3).

  Most NPR sites include an ISFSI co-located at the site for dry storage of SNF.

- DOE Locations

  6 DOE sites with SNF (see Section 3.1and 3.2)

- Other Research and Development Locations
    - 21 University research reactors on 20 sites (see Section 4.1),
    - 4 Other Government Agency Research Reactors (see Section 4.2),
    - 4 Commercial Research and Development Centers (see Section 4.3),
- Reprocessing Waste Locations
    - 3 DOE sites with reprocessing waste (see section 5.1)
    - 1 HLW storage location (see Section 3.2) which resulted from reprocessing.

The total U.S. SNF inventory is approximately 89,100 metric tons of heavy metal (MTHM) at the end of 2020 and, as indicated by Table 1-1, is comprised of about 86,600 MTHM of SNF at NPR and non-DOE ISFSI locations, about 2,500 MTHM located at DOE sites and a much smaller amount, approximately 1.3 MTHM, at Research and Development Centers. The total number of vitrified reprocessing waste canisters at the end of 2020 is 4,504, with DOE vitrified waste canisters constituting the vast majority (4,226) and with vitrified commercial reprocessing waste canisters at the West Valley Demonstration Project comprising a much smaller portion (278).

[c] Until recently there were two Away-From Reactor ISFSI locations which have NRC licenses but were never constructed: one located at the Idaho National Laboratory; and the Private Fuel Storage (PFS) in Utah. On September 12, 2021 the NRC approved an Away-from-Reactor license ISFSI application for Interim Storage Partners in Texas but, the facility has not yet been constructed. There is currently one Away-from-Reactor ISFSI license application in New Mexico under review by the Nuclear Regulatory Commission.

Table 1-1 U.S. SNF and Reprocessing Waste Inventory Summary for 2020

Location	Spent Nuclear Fuel (MTHM) [a]	Vitrified Reprocessing Waste (canisters) [b]
NPR and ISFSI Sites (excluding DOE)	86,584 [c]	-
DOE Sites		
Department of Energy Sites[d]	2,480 [e]	4,226
Other Sites	1	
University Research Reactors		
Other Government Research Reactors		
Commercial R&D Centers		
West Valley Demonstration Project [f]		278
Total	89,065	4,504

[a] Values are rounded to the nearest MTHM.

[b] Accounts only for the current inventory of vitrified reprocessing waste canisters produced through December 31, 2020 Reprocessing waste which has yet to be treated is not included. All canisters produced thus far are 2 feet in diameter × 10 feet tall.

[c] SNF inventories in this report include: SNF estimated to be discharged through December 31, 2020 from light water nuclear power generating reactors listed in Table 2-1

[d] Includes SNF from DOE research reactors.

[e] Includes SNF from DOE research and production activities, Naval SNF (approximately 37 MTHM) and some SNF generated by NPR (approximately 280 MTHM). The NPR generated SNF includes Three Mile Island Unit 2 SNF debris (approximately 82 MTHM); and SNF discharged from the decommissioned Ft. St. Vrain gas-cooled reactor (approximately 24 MTHM), SNF inventories from other reactors (approximately 68MTHM), and some early power reactor demonstration program reactors (approximately 105 MTHM).

[f] The West Valley Demonstration Project is located at the Western New York Nuclear Service Center which is owned by New York State Energy Research and Development Authority. Vitrified reprocessing waste canisters, including 2 canisters used to evacuate the melter prior to decommissioning and 1 non-routine (end-of-process) canister.

1.2 Revision History

This document is expected to be a “living” document with expanded additional information and scenarios to develop a broad range of potential inventory for project planning purposes. A description of the revision history for this report is provided in Appendix G.

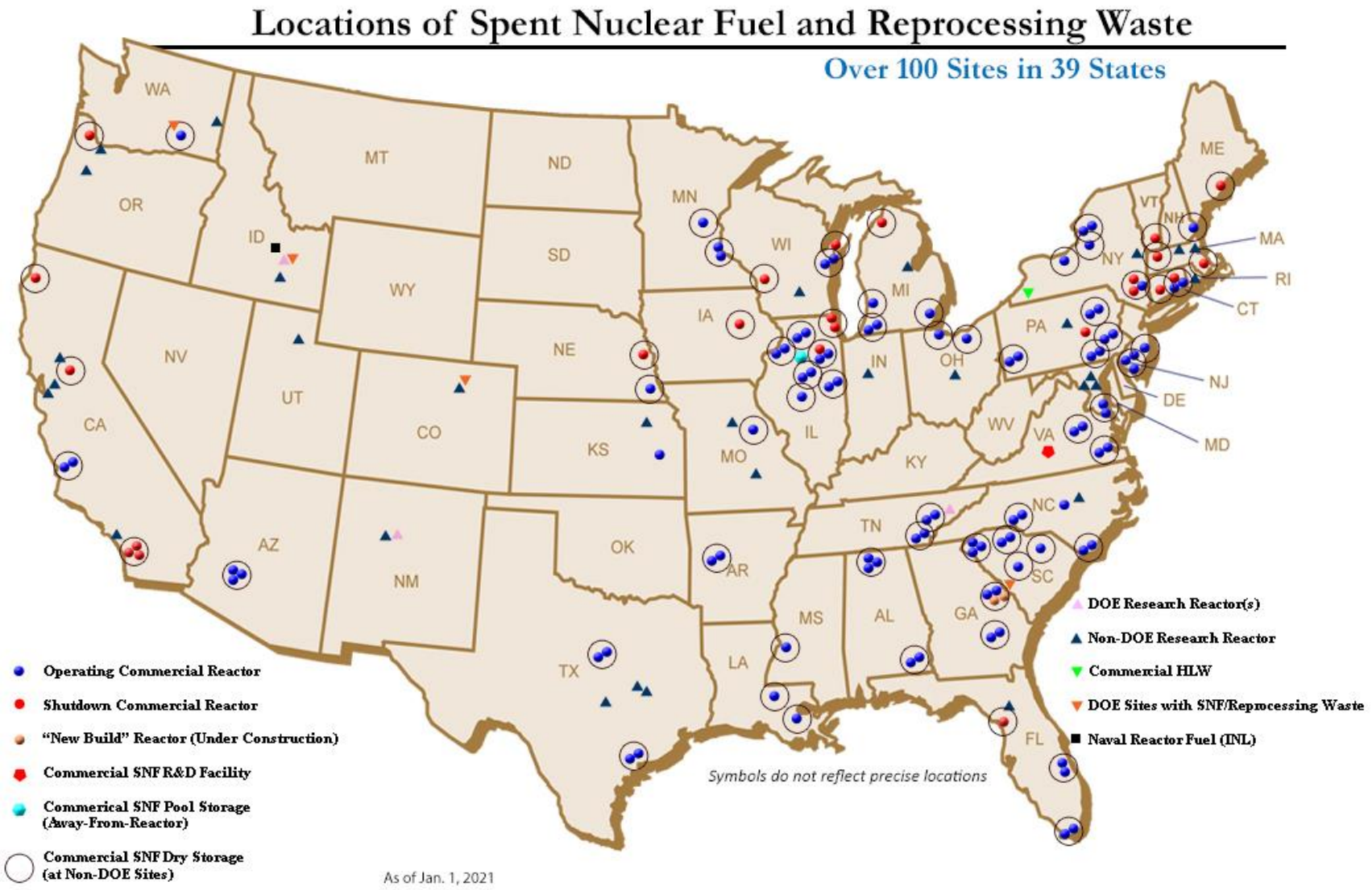


Figure 1-1. Sites Currently Storing Spent Nuclear Fuel and Reprocessing Waste

2. SNF AT NPR AND ISFSI SITES (EXCLUDING DOE LOCATIONS)

Nuclear Power Reactors (NPRs) have operated in the U.S. since about 1960. Excluding a number of civilian reactors categorized as experimental electric-power reactors (e.g. Vallecitos Boiling Water Reactor, Saxton Nuclear Experimental Reactor Project) or primarily used for purposes other than central-station nuclear power generation (e.g., N.S. Savannah), 131 NPRs have been built for civilian nuclear power generation. Nine of these were early prototype or demonstration reactors which have since been or are in a state of being decommissioned (e.g., Peach Bottom 1 and Shippingport in Pennsylvania and Fermi 1 in Illinois) and for which SNF no longer remains on site (SNF remaining from these demonstration reactors is discussed in Section 3.1.1). Another was the high temperature gas cooled Fort St. Vrain demonstration reactor in Colorado which was also decommissioned, however SNF discharged from this reactor is currently managed by DOE and stored partly in an Independent Spent Fuel Storage Installation (ISFSI) near the reactor site and partly at the Idaho National Laboratory (INL) see Section 3.1.2.

Of the remaining 121 NPRs all are light water reactors (LWRS). One LWR (Shoreham in New York) never operated at full power and was decommissioned, the SNF was transferred to another reactor and discharged there. A second (Three Mile Island Unit 2, in Pennsylvania) was disabled, and the vast majority of the SNF debris is managed by the DOE at INL see Section 3.1.2. Another 25 reactors have since shutdown, currently leaving 94 LWRs licensed to operate at the end of 2020.

A typical nuclear power plant includes one or more reactor units on the same site. Almost all of these sites also have a co-located ISFSI. After all the reactors are permanently shut down and later decommissioned, the only facility that might remain at the site is a stand-alone ISFSI. A simple site grouping structure for these NPR and non-DOE ISFSI sites has been adopted for these sites and other non-DOE ISFSI and is used throughout the report. The grouping structure is provided below to distinguish between sites based on the operational status of their reactors.

Nuclear Power Plant Sites (with NPRs and/or co-located ISFSI)

Group A: sites with all reactors permanently shutdown (**A**ll units shutdown).

Group B: sites with at least one reactor permanently shutdown co-located with at least one reactor continuing to operate (status is **B**etween Group A and Group C sites)

Group C: sites with all reactors operating or expected to resume operation, i.e., none permanently shutdown (**C**ontinuing operations with all reactors)

Other Non-DOE ISFSI Sites:

Group F: Away-from-Reactor ISFSI.

Within each group, a numeric value of 1 is appended to the site group identifier for a site with only dry SNF storage. A value of 2 is used to identify a site with both wet and dry storage, and a value of 3 is appended to sites with SNF in wet storage only. For example, Yankee Rowe is included in Site Group A and Subgroup A1, since the entire inventory of shutdown reactor SNF is currently in dry storage. Seabrook and Surry are included in Site Group C and Subgroup C2, with both wet and dry stored SNF.

Table 2-1 provides a list of LWR power plants by their assigned Groups/Subgroups. The list covers 119 reactors at 73 sites, counting the Hope Creek and Salem plants as a single site due to their proximity and shared ISFSI. Eighty-nine operating reactors are at 52 Group C sites and five are at 3 Group B sites. Three of the Group C reactors (Palisades in Michigan and Diablo Canyon 1 and 2 in California) and one Group B Reactor (Indian Point 3 in New York) have utility-announced early shutdown dates before the end of 2025.

Of the 25 shutdown reactors with SNF remaining onsite, 21 are reactors at 18 sites with no continuing nuclear operations (Group A sites). This includes SNF from 10 reactors on 9 sites that ceased operations prior to 2000 and where all SNF is in dry storage and reactor decommissioning is complete or nearing

completion. This subgroup is sometimes referred to as "legacy" shutdown reactor sites, since these sites have not had an operating reactor on the site for at least 20 years. Group A also includes SNF from 11 reactors on 9 sites that ceased operations after 2000. This subgroup is sometimes referred to "Early Shutdown Reactors" since operations were halted prior to achieving 60 years of operations. Six of these early shutdown reactors on 4 sites have recently completed moving the SNF into dry storage, bringing the total number of subgroup A1 reactors to 17 reactors on 14 sites. Three reactors on 3 sites in Group A still have SNF both in the pools and in dry storage and one Group A reactor has not yet implemented dry storage by the end of 2020.

In addition to the 21 shutdown reactors at 18 shutdown sites, SNF from 4 shutdown reactors (i.e., Dresden 1 in Illinois, Millstone 1 in Connecticut, and Indian Point 1 and 2 in New York) is stored on sites co-located with operating reactors (Group B). Figure 1-1 illustrates the locations of these shutdown nuclear power reactors.

For the 119 LWRs with SNF still located on site, the SNF is currently stored in pools or dry storage casks within an ISFSI with disposal in a geologic repository envisioned in a once-through fuel cycle. Some NPR SNF has been transferred to DOE (see Section 3.1.2). The General Electric-Hitachi facility at Morris, Illinois (the lone Group F Site) is currently the only non-DOE operated, NRC licensed pool storage facility that is not co-located at a reactor site. On September 12, 2021 the NRC approved an Away-from-Reactor ISFI license application for Interim Storage Partners in Texas but, the facility has not yet been constructed. There is currently one Away-from-Reactor ISFSI license application in New Mexico under review by the Nuclear Regulatory Commission.

SNF includes irradiated fuel discharged from pressurized water reactors (PWRs) and boiling water reactors (BWRs). The fuel used in these reactors primarily consists of uranium dioxide pellets encased in zirconium alloy (Zircaloy). A small number of early fuel designs used stainless steel cladding. The fuel assemblies vary in physical configuration, depending upon reactor type and manufacturer.

Discharged SNF assemblies are categorized by physical configuration into 22 classes: 16 PWR and 6 BWR fuel assembly classes. Discharged SNF data has been collected by the Energy Information Administration for the Office of Standard Contract Management within the Office of General Counsel (formerly part of Office of Civilian Radioactive Waste Management [OCRWM]). Appendix A, Tables A-1 and A-2 present the assembly class, array size, fuel manufacturer, assembly version, assembly type code, length, width, and cladding material of PWR SNF and BWR SNF, respectively. Physical dimensions are those of unirradiated assemblies. Within an assembly class, assembly types are of a similar size. There are 134 individual fuel assembly types in these classes. Appendix A, Table A-3 presents the manufacturer, initial uranium load, enrichment, and burnup characteristics of NPR SNF assembly types in existence at the end of 2002. Some new fuel types have been introduced since 2002, however, similar information to that presented in Appendix A is not available because non-propriety data sources do not exist.

Table 2-1 LWR Nuclear Power Generation Sites by Group/Subgroup (as of December 2020)

Group A: All Units Shutdown Sites (# of Units) – 21 Reactors/18 Sites			
A1 (Dry Storage)		**A2 (Dry and Pool Storage)**	**A3 (Pool Storage)**
Reactors Shutdown Prior to 2000			Three Mile Island (1) ††
Big Rock Point (1)	Rancho Seco (1)	Oyster Creek (1)	
Haddam Neck (1)	Trojan (1)	Pilgrim (1)	
Humboldt Bay (1)	Yankee Rowe (1)	Duane Arnold (1)	
La Crosse (1)	Zion (2)		
Maine Yankee (1)			
Reactors Shutdown Post 2000			
Crystal River (1)	Vermont Yankee (1)		
Kewaunee (1)	Fort Calhoun (1)		
San Onofre (3)			

Group B: Mixed Status Sites (# of Units) – Total 9 Reactors (5 Operating, 4 Shutdown) /3 Sites		
	B2† (Dry and Pool Storage)	
Currently All Group B Sites have both Dry and Wet Storage Capabilities	Dresden (3)	
	Indian Point (3)	
	Millstone (3)	

Group C: All Units Operating (# of Units)– 89 Reactors /52 Sites (Note: All Group C Sites have Wet Storage Capabilities)			
C2 (Dry and Pool Storage)			**C3 (Pool Storage)**
Arkansas Nuclear (2)	Fitzpatrick (1)	Point Beach (2)	Shearon Harris (1)
Beaver Valley (2)	Fermi (1) ††	Prairie Island (2)	Wolf Creek (1)
Braidwood (2)	Ginna (1)	Quad Cities (2)	
Browns Ferry (3)	Grand Gulf (1)	River Bend (1)	
Brunswick (2)	Hatch (2)	Robinson (1)	
Byron (2)	Hope Creek (1) ‡‡	Saint Lucie (2)	
Calvert Cliffs (2)	La Salle (2)	Salem (2) ‡‡	
Callaway (1)	Limerick (2)	Seabrook (1)	
Catawba (2)	McGuire (2)	Sequoyah (2)	
Clinton (1)	Monticello (1)	South Texas (2)	
Columbia Generating Station (1)	Nine Mile Point (2)	Summer (1)	
Comanche Peak (2)	North Anna (2)	Surry (2)	
Cooper (1)	Oconee (3)	Susquehanna (2)	
Davis-Besse (1)	Palisades (1)	Turkey Point (2)	
D.C. Cook (2)	Palo Verde (3)	Vogtle (2)	
Diablo Canyon (2)	Peach Bottom (2) ††	Waterford (1)	
Farley (2)	Perry (1)	Watts Bar (2)	

† Indian Point has 2 shutdown reactors and 1 operating reactor while the other 2 B2 Sites have a single shutdown reactor and 2 operating reactors.
†† Does not include prototype (Fermi 1), experimental (Peach Bottom-1), or disabled (TMI-2) reactors.
‡‡ Hope Creek and Salem are considered as a single site in this report due to proximity and shared ISFSI.

2.1 Current NPR and Away-From-Reactor SNF Inventory

The source of historical inventory data for this study is information collected by the Energy Information Administration (EIA). Information collected from GC-859 forms is available on an assembly basis for SNF discharges from 1968 through December, 2017.

To develop an inventory estimate through 2020 and beyond, SNF discharge projections were developed using the U.S. Commercial Spent Nuclear Fuel Projection tool [Vinson, 2015]. The methodology used by the tool is documented in "Description and Validation of a Revised Tool for Projecting U.S. Commercial Spent Nuclear Fuel Inventory", March 2015 [Vinson, 2015]. The tool allows for multiple methodologies for handling plant capacity factors, reactor uprates, and other operating inputs. Based on the validation report findings, the methodology utilized in this report makes no adjustment for reactor-specific capacity factors or EIA-forecast nuclear energy demand data. This methodology was found to provide the best agreement to preliminary GC-859 data (<1.4% difference between preliminary GC-859 and projected assembly discharged data between the beginning of 2003 and the end of 2012) [Vinson 2015].

The projection method forecasts each LWR individually and these quantities have been adopted for this study except for shutdown reactors that have published the actual quantities of discharged SNF. Actual discharges from reactors shutdown prior to December 31, 2017 are taken from the GC-859 EIA survey. Data for reactors shutdown after this date are a combination of the historical data and the forecast discharges up to the announced shutdown date.

Table 2-2 provides the estimated SNF discharged at the end of 2020 by reactor type. The total projected inventory is more than 86,650 metric tons (MT) of uranium (MTU) contained in approximately 300,470 discharged assemblies. The table is detailed to provide actual discharges through December 31, 2017 from the GC-859 data set and the projected quantities between 1/1/2018 and 12/31/2020.

Table 2-2. Estimated Reactor Discharges by Reactor Type, Detailed by GC-859* and Forecast Quantities

	SNF Discharged through 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Total Estimated Discharged SNF through 12/31/2020	
Reactor Type	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
PWR	119,338	51,808	9,867	4,355	129,205	56,163
BWR	157,774	28,090	13,490	2,402	171,264	30,492
Totals	**277,112**	**79,898**	**23,357**	**6,757**	**300,469**	**86,655**

* Excludes SNF that was reprocessed at West Valley in NY, removed from TMI Unit 2, or discharged from the Fort St. Vrain reactor (now decommissioned).

2.1.1 SNF Transfers

The values reported in Table 2-2 indicate reported and forecast discharge quantities by reactor type and do not reflect subsequent transfer of discharged SNF assemblies. Utilities did not report (via GC-859 forms) SNF that was transferred to West Valley, NY for reprocessing. Prior to 2000, some discharged SNF was transferred to other locations. Five reactors transferred some of their discharged SNF to the pool storage facility at Morris, IL. Table 2-3 details the transfers to Morris which totals 3,217 assemblies and approximately 674 MTU.

The EIA survey process indicates approximately 73 MTU of the SNF from the reactors listed in Table 2-1 was transferred to DOE for research and development purposes such as fuel rod consolidation, dry storage demonstrations, and nuclear waste vitrification projects. This SNF has been transferred to the DOE and is not stored in NRC licensed facilities. DOE has dispositioned some of the material transferred, and so the quantity which remains in storage is approximately 68 MTU. This quantity does not include Ft. St. Vrain and TMI-2 SNF debris that is stored in an NRC-licensed ISFSI at INL. See Section 3.1.2.

Since 2000, essentially all SNF generated has remained on the generating reactor sites in either pool or dry storage. Some utilities did transfer some SNF between its operating reactors (see Table 2-4).

Table 2-3. SNF Transferred to Pool Storage at Morris, Illinois

		Discharges as of Dec 2017		Transferred to Morris	
Reactor [Unit] (Site Subgroup)	**Operating Status**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**
Cooper (C2)	Operating	3,964	722.49	1,054	198.02
Dresden 2 (B2)	Operating	5,729	1,020.99	753	145.19
Monticello (C2)	Operating	3,612	642.17	1,058	198.19
Haddam Neck (A1)	Shutdown	1,102	448.42	82	34.48
San Onofre 1 (A2)	Shutdown	665	244.61	270	98.41
			Totals	**3,217**	**674.29**

Table 2-4. Nuclear Power Reactor SNF Transfers

Discharge Reactor	Transferred SNF		Transferred to Reactor Site
	Assemblies	Estimated Initial Uranium (MT)	
Robinson	304	132.2	Brunswick
Robinson	504	219.3	Shearon Harris
Brunswick	4,391	784.4	Shearon Harris
Oconee	300	139.8	McGuire

Table 2-5 provides a summary of estimated SNF inventory, by Site Group and storage method, as of December 31, 2020. Table 2-5 excludes discharges that were reprocessed at West Valley, NY, and transfers to DOE for research and development purposes and therefore represents the quantity of SNF stored at the 119 power reactor sites and the away from reactor pool storage location at Morris, IL.

Table 2-6 provides the end of 2020 inventory remaining at the LWR sites by storage method accounting for all known SNF transfers (this does not include the inventory at Morris). The dry storage assembly and canister/cask quantities as of 12/31/2020 have been derived from publicly available sources [Store Fuel, 2021]. The balance of the projected inventory remains in the reactor pools. Appendix B provides additional details on a reactor specific basis and site group basis. Appendix B reflects known transfers.

Figure 2-1 illustrates the current distribution by site group and storage method, and Figure 2-2 illustrates the current distribution of storage casks by site group.

The estimated burn-up (GWd/MTHM) distribution and the initial enrichment (% U-235) distribution for the current inventory (as extracted from the GC-859 and projection tool forecast) are shown in Figures 2-3 and 2-4. Similar to the discharge quantities, the enrichment and burn-up is estimated for individual LWRs based on the last 5 discharge cycles reported in the GC-859 database. Adjustments are made for reactor power uprates where applicable. These estimates are also used to generate Figures 2-5 through 2-7, described below.

Figure 2-5 shows the annual average Burn-up (GWd/MT) and the initial enrichment (% U-235) between 1968 and 2020.

Figure 2-6 provides the Burn-up (GWd/MT) distribution based on assembly counts for the PWR and BWRs.

Figure 2-7 provides the Burn-up (GWd/MT) distribution based on the initial uranium mass (MTU) for the PWR and BWRs.

Table 2-5. Spent Nuclear Fuel Inventory by Reactor Group/Subgroup (Estimate as of 12/31/2020)

Site Group/ Subgroup	Dry Inventory**			Pool Inventory		Site Total	
	Assy.	Initial Uranium (MT)	Number of Casks	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)
Group A Sites							
A1 Pre 2000	7,659	2,815	248	-	-	7,659	2,815
A1 Post 2000	11,576	3,882	298	-	-	11,576	3,882
A2	5,808	1,037	92	6,457	1,152	12,265	2,188
A3	-	-	-	1,663	786	1,663	786
A	**25,043**	**7,734**	**638**	**8,120**	**1,938**	**33,163**	**9,672**
Group B Sites							
B1	-	-	-	-	-	-	-
B2	8,756	2,268	178	12,748	3,355	21,504	5,623
B3	-	-	-	-	-	-	-
B	**8,756**	**2,268**	**178**	**12,748**	**3,355**	**21,504**	**5,623**
Group C Sites							
C1	-	-	-	-	-	-	-
C2	108,796	31,606	2,518	125,429	36,530	234,225	68,136
C3	-	-	-	8,127	2,479	8,127	2,479
C	**108,796**	**31,606**	**2,518**	**133,556**	**39,009**	**242,352**	**70,615**
Group F Sites							
F	**-**	**-**	**-**	**3,217**	**674**	**3,217**	**674**
Total All Sites	**142,595**	**41,608**	**3,334**	**157,641**	**44,976**	**300,236**	**86,584**

* Discharges exclude NPR SNF reprocessed at West Valley in NY, removed from TMI Unit 2, discharged from the decommissioned Fort St. Vrain reactor, or transferred to DOE for R&D purposes.

** Dry storage cask and assembly quantities at the end of 2020 are as reported in Storefuel Vol 23 No. 269, Jan. 5, 2021.

† Mass values for totals were rounded up to the next MTHM, totals are rounded, after summing pre-rounded values.

Table 2-6. Estimated Current Inventory at NPR sites by Storage Method

	Dry Inventory 12/31/2020			Pool Inventory		Total Projected Discharged SNF 12/31/2020	
Reactor Type	**Assy.**	**Initial Uranium (MT)**	**SNF Casks**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
PWR	64,446	27,702	2,158	68,354	28,920	132,800	56,622
BWR	78,149	13,905	1,176	86,070	15,381	164,219	29,286
Totals	**142,595**	**41,607**	**3,334**	**154,424**	**44,301**	**297,019**	**85,908**

Appendix B, Tables B-1 – B-5 provide additional details of this estimate on a reactor specific basis.

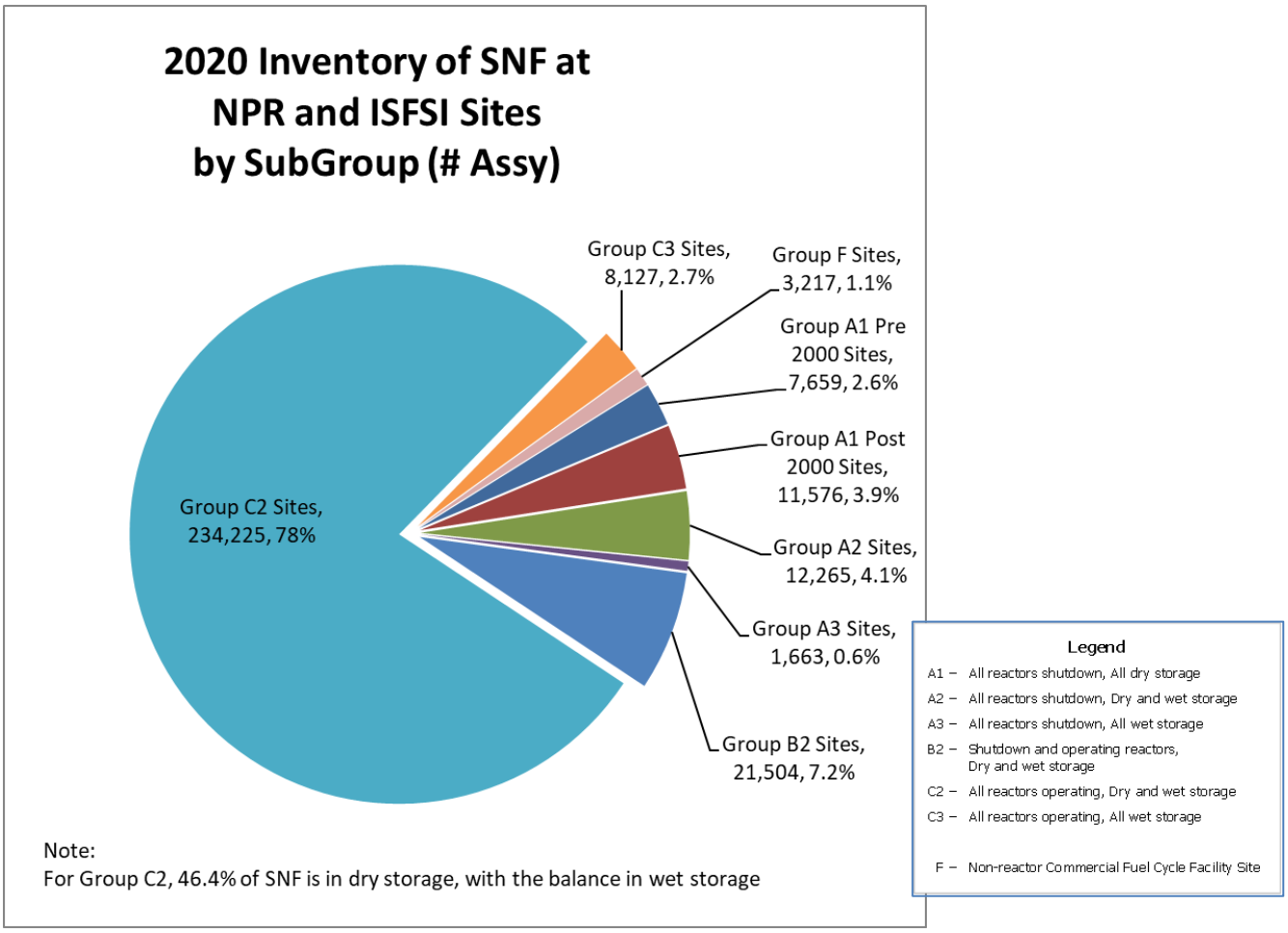


Figure 2-1. Nuclear Power Reactor and ISFSI Sites (non-DOE) Currently Storing SNF

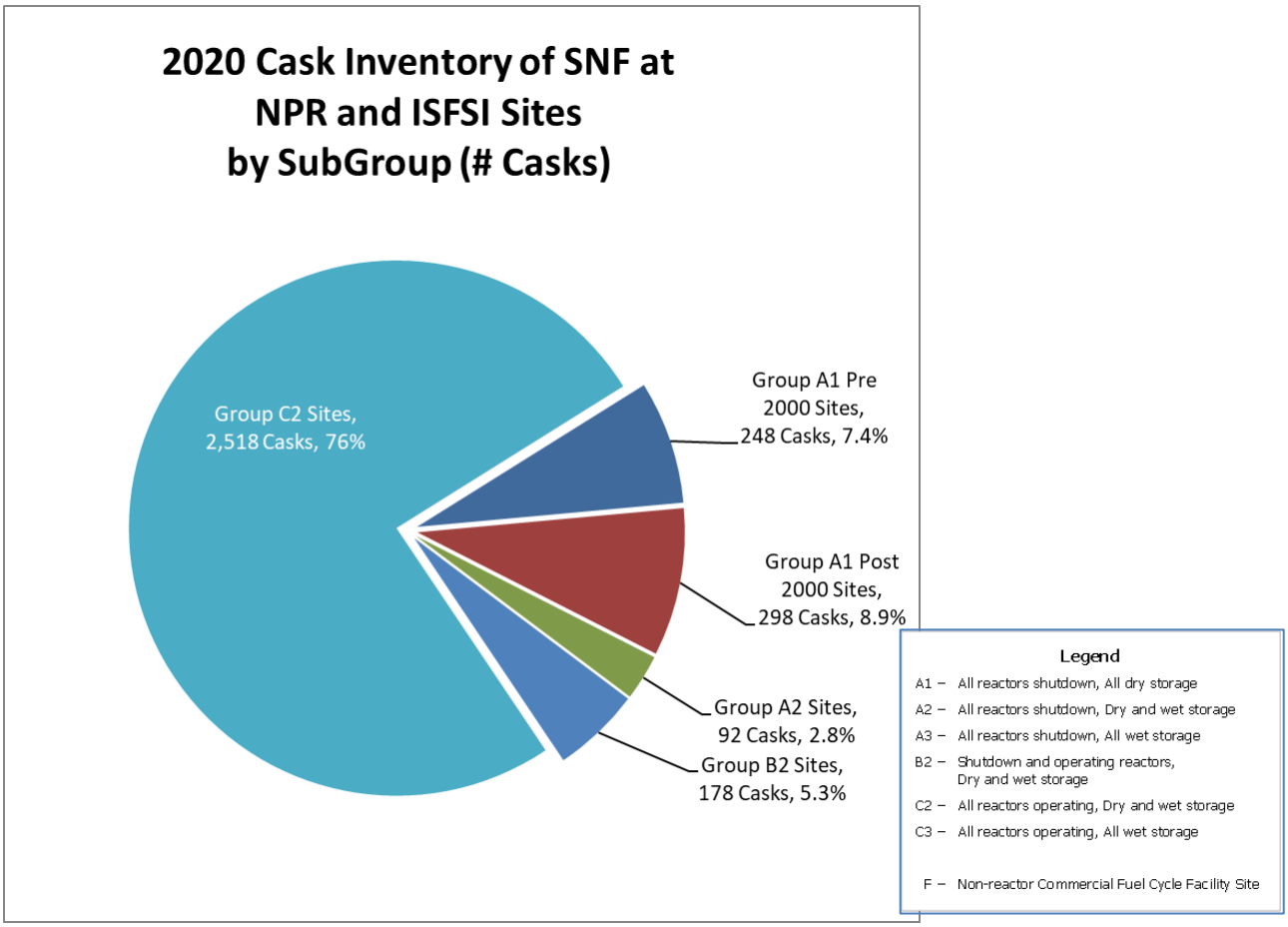


Figure 2-2. Dry SNF Storage at Nuclear Power Reactor Sites

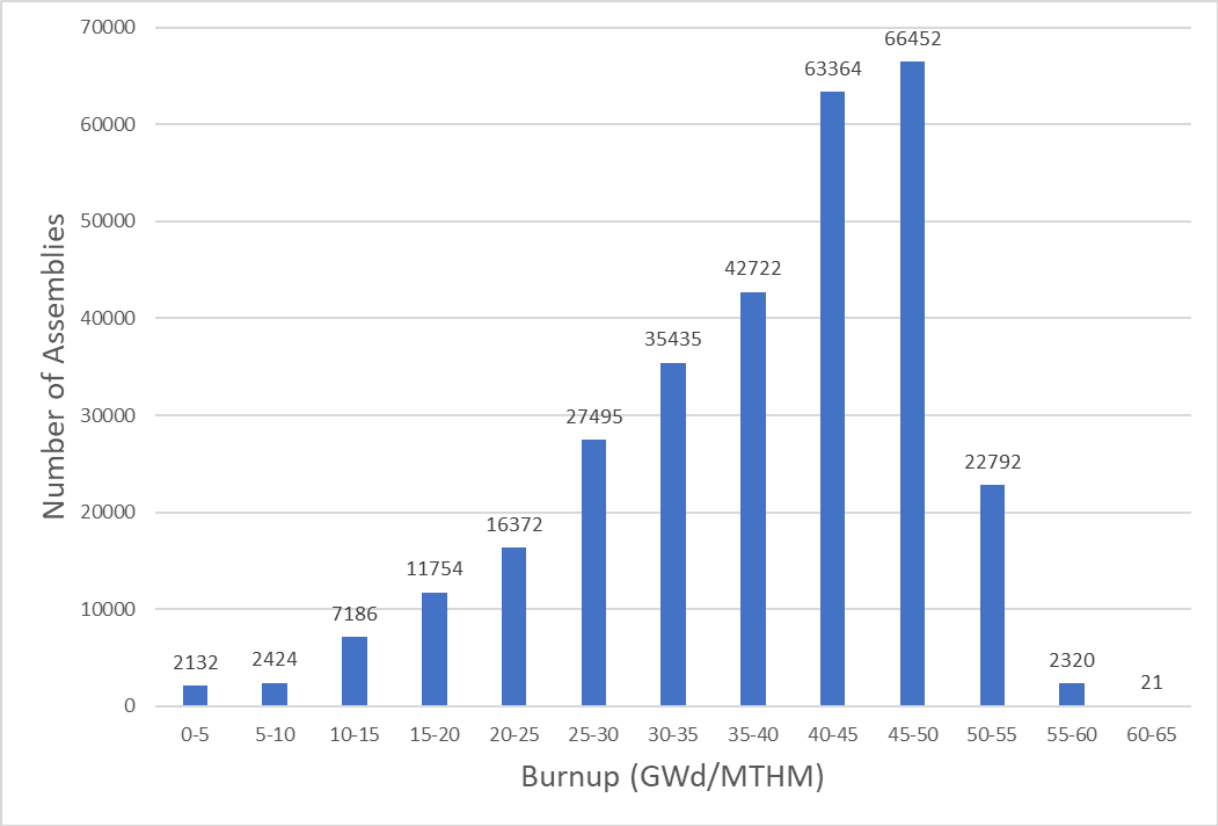


Figure 2-3 Estimated Burn-up (GWd/MTHM) Distribution for SNF Through December 2020

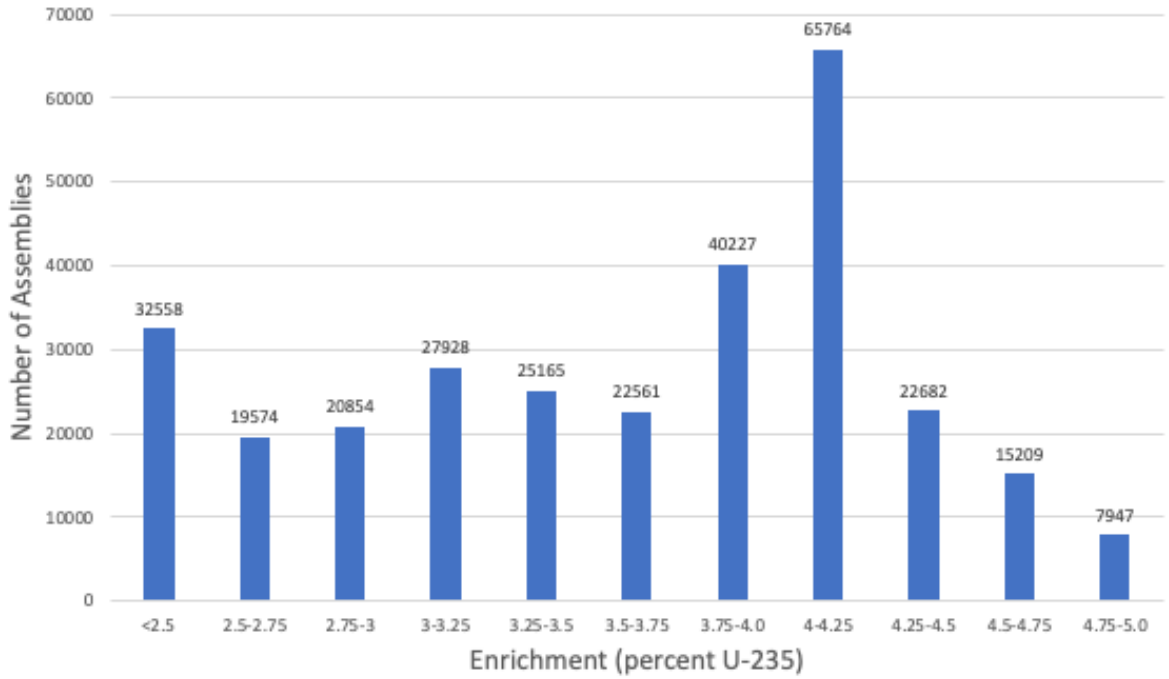
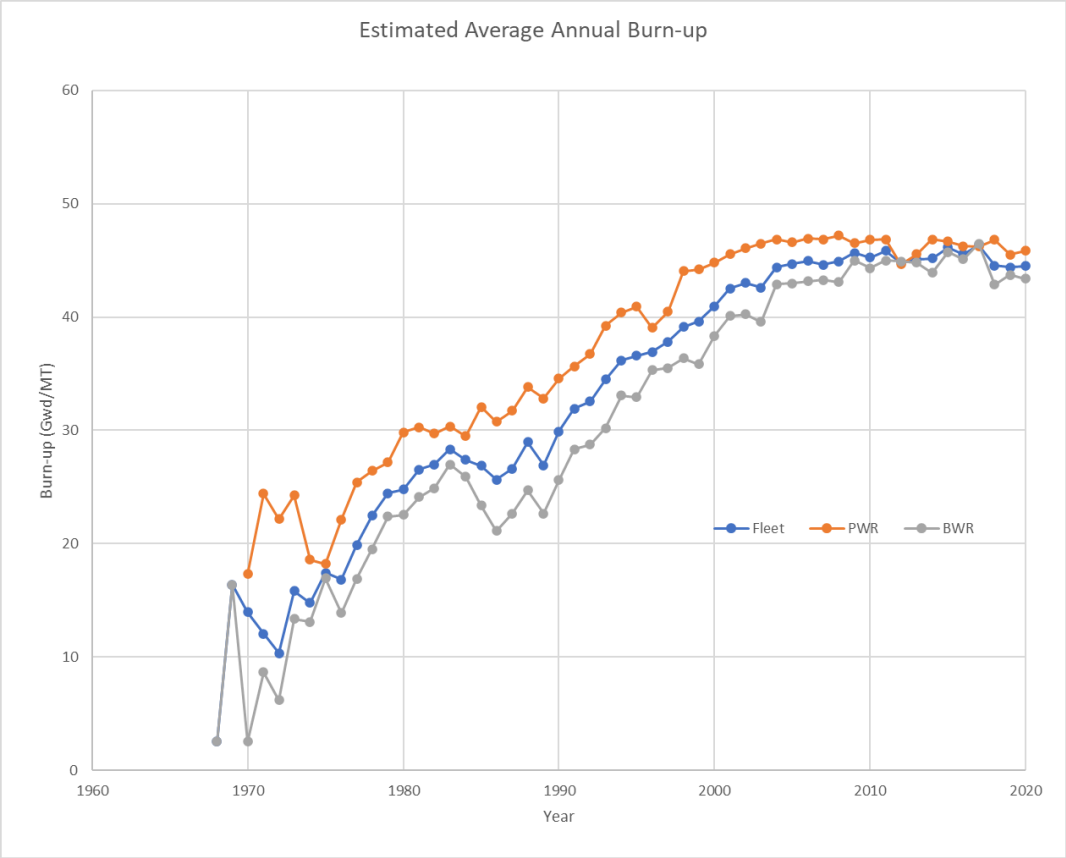


Figure 2-4 Estimated Initial Enrichment (% U-235) Distribution for SNF Through December 2020



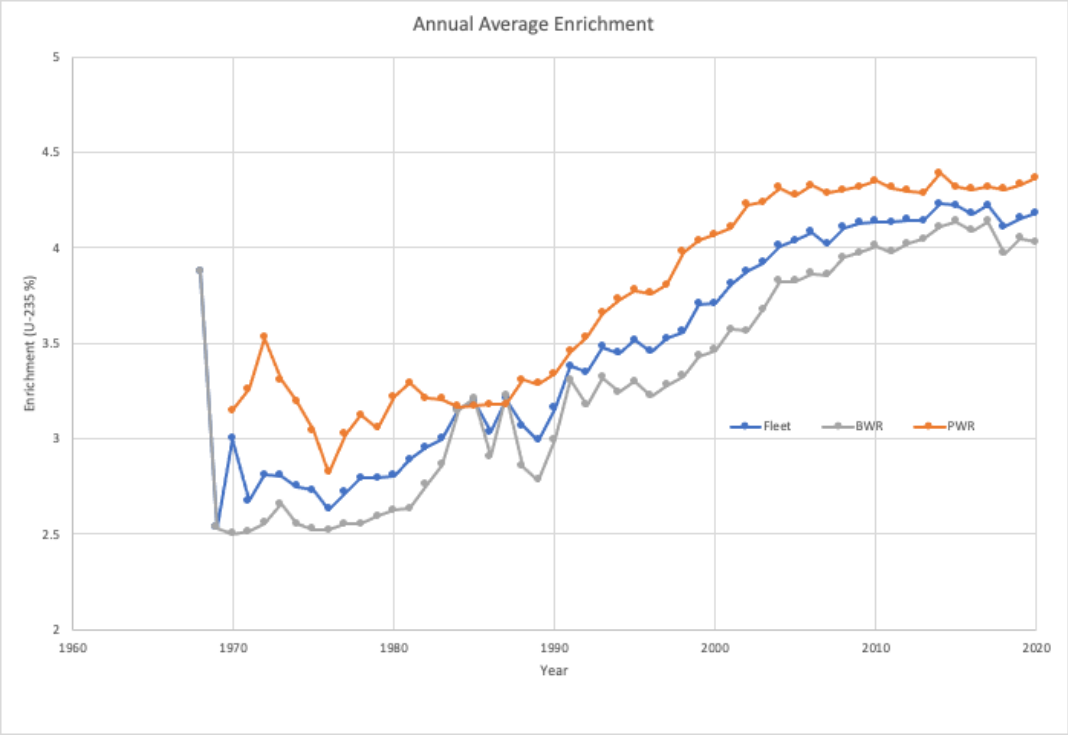


Figure 2-5 Average Annual Burn-up (GWd/MT) and Enrichment (U-235%)

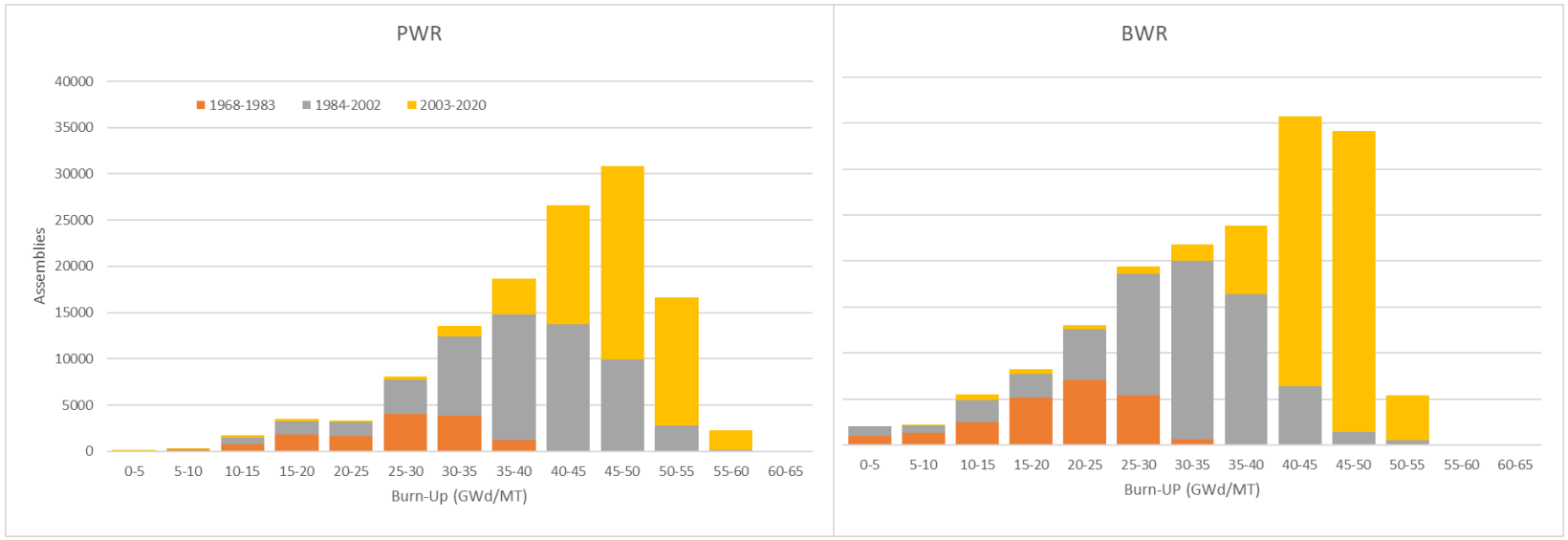


Figure 2-6 Estimated Burn-up (GWd/MTHM) Distribution by Assembly Count for SNF Through December 2020

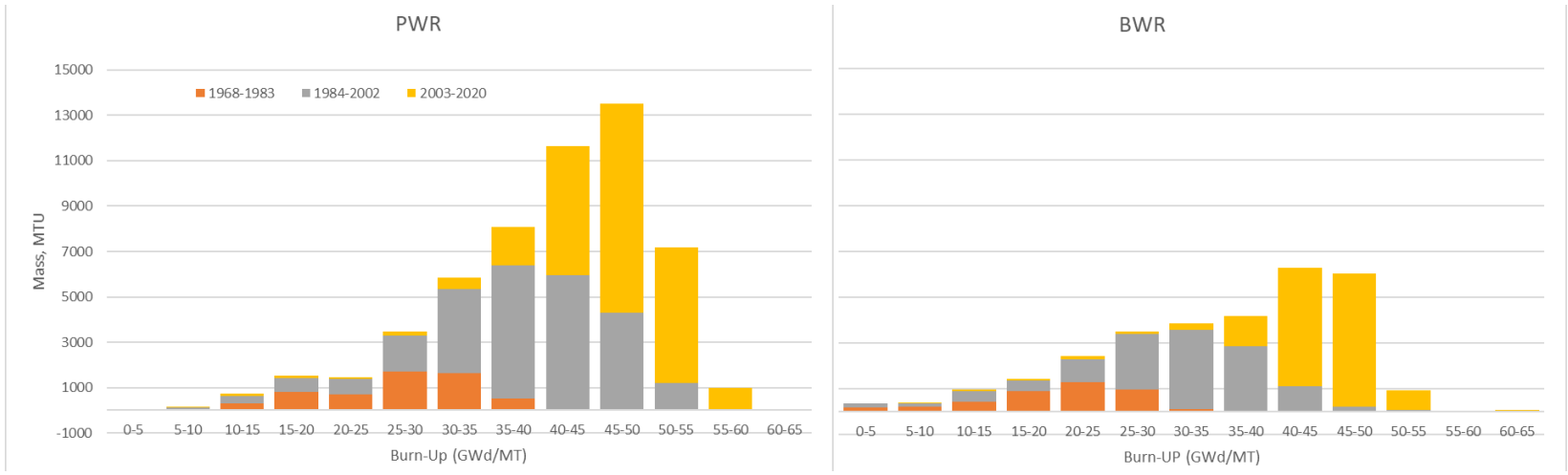


Figure 2-7 Estimated Burn-up (GWd/MTHM) Distribution by Initial Uranium Mass for SNF Through December 2020

2.1.2 Shutdown Reactor SNF as of 12/31/2020

The shutdown reactors continue to increase as well as the corresponding total quantity of SNF at these sites and the amount in dry storage. On 12/31/2020 (the data date for this report) the inventory at 25 shutdown reactors with SNF remaining on site includes the following categories.:

- Reactors that were shutdown prior to 2000 with no other ongoing nuclear operations. Table 2-7 and Figure 2-8 provides additional details on this category. This SNF (from 10 reactors) is located at nine sites and totals 7,659 assemblies containing 2,815 MTU. SNF at these sites was discharged prior to 2000, and the quantities are from the GC-859 database. Also shown in the table and figure are the number of storage casks loaded with Greater-than-Class C (GTCC) Low-Level Radioactive Waste (LLRW) to provide a complete cask count for these sites, since GTCC casks for sites with shutdown reactors are typically stored at the ISFSI along with the SNF casks[d].
- Early shutdown reactor SNF (from eleven reactors) at nine sites are those reactors which have ceased operations since 2000 and prior to reaching the 60-year operating lifetime. Table 2-8 and Figure 2-9 provides the detailed inventory of each of these eleven reactors. There are no nuclear operations on these sites. This category includes:
  - Crystal River was last operated in 2009 and has an official shutdown date of February 20, 2013. Crystal River data are based on the GC-859 database.
  - Kewaunee was shutdown in May of 2013. Kewaunee data are based on the GC-859 database.
  - San Onofre 1 last operated in 1992 (shutdown 11/30/1992). San Onofre 2 and 3 last operated in 2012 and were officially shutdown on 6/12/2013. The inventory is based on the GC-859 database.
  - Vermont Yankee shutdown on December 29, 2014. The inventory is based on the GC-859 database.
  - Fort Calhoun was shutdown in October of 2016. The inventory is based on the GC-859 database.
  - Oyster Creek last operated 9/17/2018. The inventory is based on the GC-859 database and the forecast beyond 12/31/2017.
  - Pilgrim last operated 5/31/2019. The inventory is based on the GC-859 database and the forecast beyond 12/31/2017.
  - Three Mile Island Unit 1 last operated 9/20/2019. The inventory is based on the GC-859 database and the forecast beyond 12/31/2017.
  - Duane Arnold last operated 10/12/2020. The inventory is based on the GC-859 database and the forecast beyond 12/31/2017.
- Recently several utilities have announced their intentions to shutdown four additional reactors on 3 sites prior to reaching a 60-year operating lifetime. These reactors are planned for shutdown before 2025. Table 2-9 and Figure 2-10 details the scenario inventory based on GC-859 and forecast

[d] This report does not provide an over-arching estimate for GTCC LLRW associated with decommissioning the U.S. fleet of current and future nuclear power reactors. For estimates of GTCC LLRW and information on the characteristics of this type of waste and its disposal, the reader is referred to Final Environmental Impact Statement for the Disposal of GTCC LLRW and GTCC-Like Waste [DOE, 2016].

discharges from these reactors beyond 2017. Once shutdown, there will be no other nuclear operations on these sites.

- Shutdown reactor SNF discharged by four permanently shutdown reactors at sites with continued nuclear operations (Group B sites) are detailed in Table 2-12 and Figure 2-11. Three reactors shutdown prior to 2000 and the quantities are based on the GC-859 database. Indian Point Unit 2 last operated on 4/30/2020. The inventory is based on the GC-859 database and the forecast beyond 12/31/2017.

The Group A reactors include seventeen reactors on fourteen sites that have only dry storage capabilities (A1); three reactors on three sites with SNF in both wet and dry storage (A2); and one reactor which has only pool storage (A3) at the end of 2020. All the Group A sites that shutdown prior to 2000 (10 reactors on 9 sites) are Subgroup A1 sites. Five of the Group A sites shutdown after 2000 (Crystal River, Kewaunee Vermont Yankee, Ft. Calhoun and San Onofre) recently completed SNF pool de-inventory as part of the decommissioning process and became Subgroup A1 sites. The Group A sites now total approximately 33,200 assemblies containing approximately 9,675 MTU which is forecast to be stored in 786 SNF canisters/casks (638 canisters are currently loaded with approximately 148 canisters remaining to be loaded).

Table 2-7. SNF and Stored GTCC LLRW at Group A Sites Shutdown Prior to 2000

		Discharges		Transferred		Remaining Inventory at the end of 2020				
Reactor	Shutdown Date	Assemblies	Initial Uranium (MT)	Assemblies	Initial Uranium (MT)	Assemblies	Initial Uranium (MT)	SNF Casks Loaded / Estimated		GTCC LLRW Casks Loaded
Big Rock Point	8/29/1997	526	69.40	85	11.48	441	57.92	7	7	1
Haddam Neck	12/5/1996	1,102	448.42	83	34.89	1,019	413.53	40	40	3
Humboldt Bay 3	7/2/1976	390	28.94	-	-	390	28.94	5	5	1
La Crosse	4/30/1987	334	38.09	1	0.12	333	37.97	5	5	-
Maine Yankee	12/6/1996	1,434	542.26	-	-	1,434	542.26	60	60	4
Rancho Seco	6/7/1989	493	228.38	-	-	493	228.38	21	21	1
Trojan	11/9/1992	790	359.26	-	-	790	359.26	34	34	-
Yankee Rowe	10/1/1991	533	127.13	-	-	533	127.13	15	15	1
Zion 1	2/21/1997	1,143	523.94	-	-	1,143	523.94	-	-	2
Zion 2	9/19/1996	1,083	495.47	-	-	1,083	495.47	-	-	2
Zion Totals	-	2,226	1,019.41	-	-	2,226	1,019.41	61	61	4
Totals	**-**	**7,828**	**2,861.28**	**169**	**46.49**	**7,659**	**2,814.79**	**248**		**15**

* One assembly at Big Rock Point was consolidated into other assemblies.

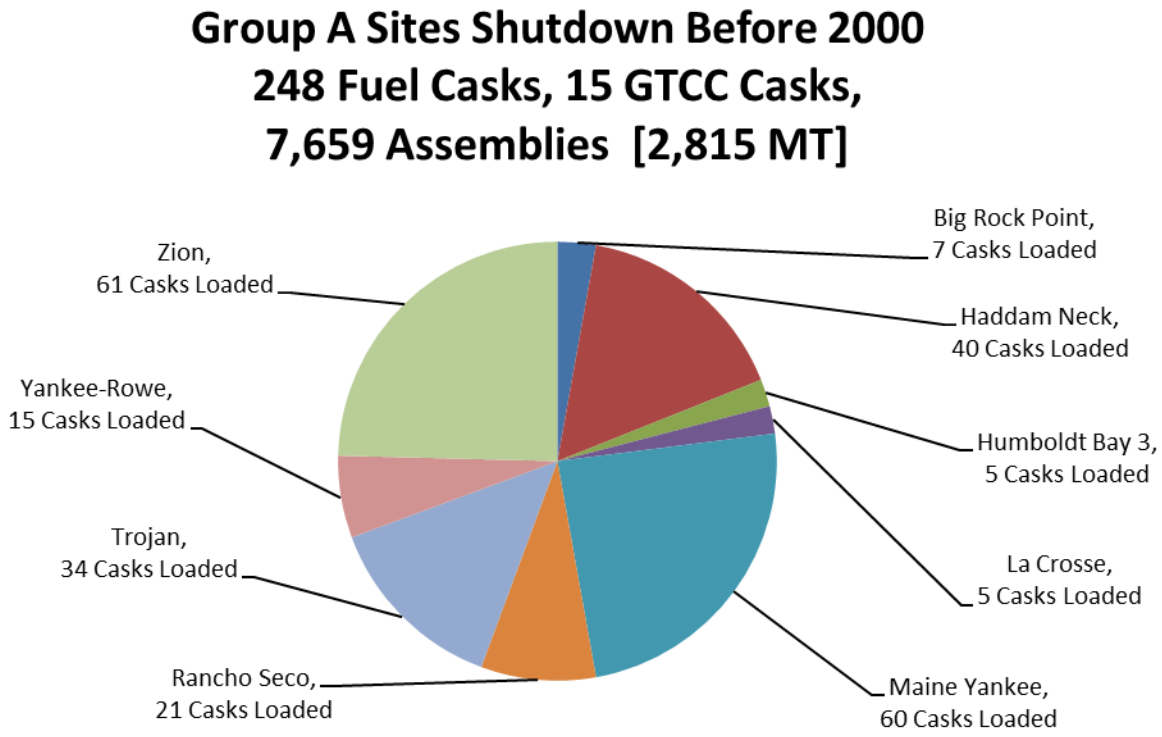


Figure 2-8. Dry SNF Storage at Group A Sites Shutdown Before 2000

Table 2-8. SNF and Stored GTCC LLRW from Group A Sites Shutdown Post 2000

		Discharges as of 12/31/2017†		Forecast Discharges 1/1/2018 to 12/31/2020		Total Projected Discharged SNF through 12/31/2020†					
Reactor [Unit]	Shutdown Date	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	SNF Casks Loaded / Estimated		GTCC LLRW Casks Loaded / Estimated**	
Duane Arnold	10/12/2020	3,128	566	520	94	3,648	660	30	60	-	2
Crystal River 3	2/20/2013	1,243	582	-	-	1,243	582	39	39	-	2
Fort Calhoun	10/24/2016	1,264	466	-	-	1,264	466	40	40	-	2
Kewaunee	5/7/2013	1,335	519	-	-	1,335	519	38	38	-	2
Oyster Creek	9/25/2018	3,944	701	560	96	4,504	797	34	74	-	2
Pilgrim	5/31/2019	3,533	630	580	101	4,113	731	28	61	-	2
San Onofre	various	3,855	1,609	-	-	3,855	1,609	123	123	1	5
Three Mile Island 1	9/20/2019	1,486	700	177	85	1,663	786	-	45	-	2
Vermont Yankee	12/29/2014	3,879	706	-	-	3,879	706	58	58	-	2
Totals		**23,667**	**6,480**	**1,837**	**376**	**25,504**	**6,856**	**390**	**538**	**1**	**21**

† These inventory data reflect SNF assembly transfers.

**For simplicity GTCC Casks are estimated at 2 per reactor unless decommissioning is complete. More detailed information on estimates of GTCC LLRW can be found in [DOE, 2016] and supporting documentation.

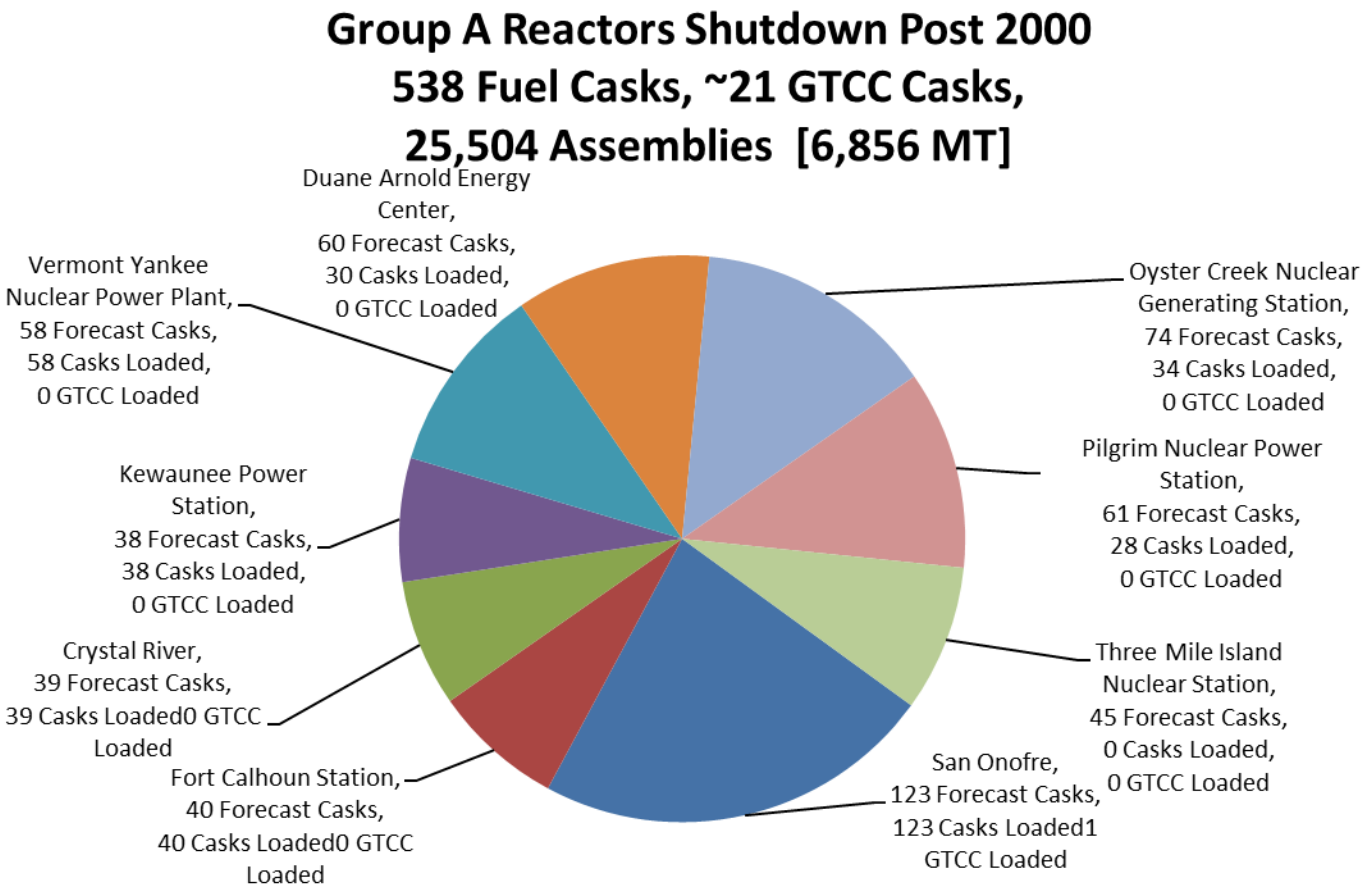


Figure 2-9. Dry SNF Storage at Group A Sites Shutdown Post 2000

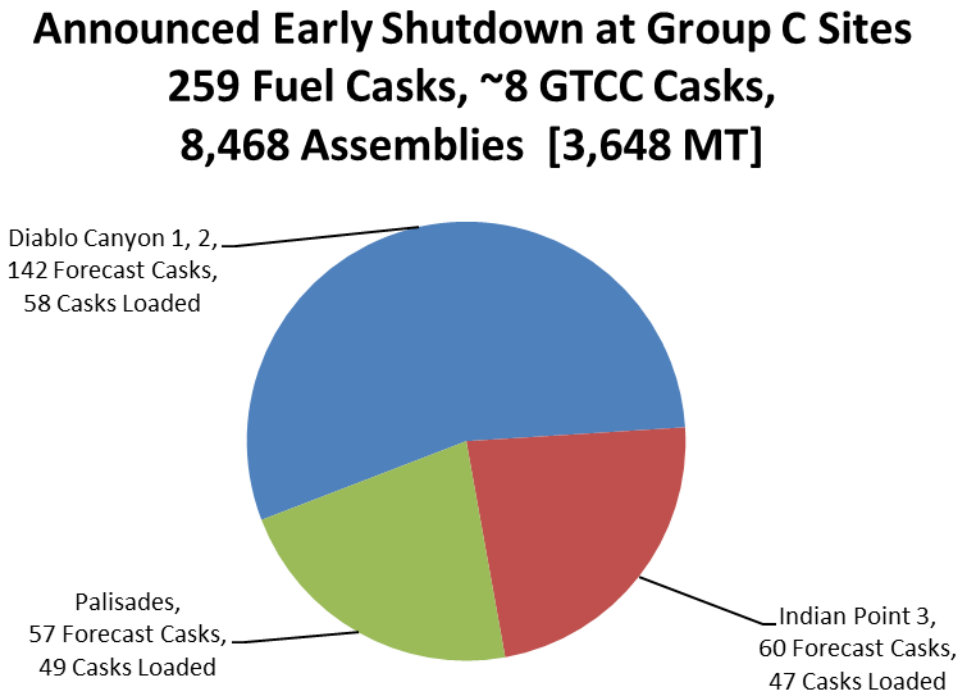
Table 2-9. SNF and Stored GTCC LLRW from Groups B&C Sites with Announced Early Shutdown Dates

		Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Total Projected Discharged SNF through 12/31/2020					
Reactor [Unit]	**Announced Shutdown Date**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**SNF Casks Loaded / Estimated**		**GTCC LLRW Casks Loaded / Estimated***	
Indian Point 3	4/30/2021	1,568	714	94	42	1,855	844	47**	60	-	2
Palisades	4/30/2022	1,701	699	128	55	2,097	869	49	57	-	2
Diablo Canyon 1	11/2/2024	1,680	723	186	79	2,245	962	58***	71	-	2
Diablo Canyon 2	8/26/2025	1,608	692	188	80	2,271	973		71	-	2
	Totals	**6,557**	**2,829**	**596**	**255**	**8,468**	**3,648**	**155**	**259**	**-**	8

* For simplicity GTCC Casks are estimated at 2 per reactor unless decommissioning is complete. More detailed information on estimates of GTCC LLRW can be found in [DOE, 2016] and supporting documentation.

** Indian Point loaded casks includes SNF from Unit 2 in the site ISFSI

*** Site total canisters from both units included.



** Indian Point loaded casks includes SNF from Unit 2 in the site ISFSI

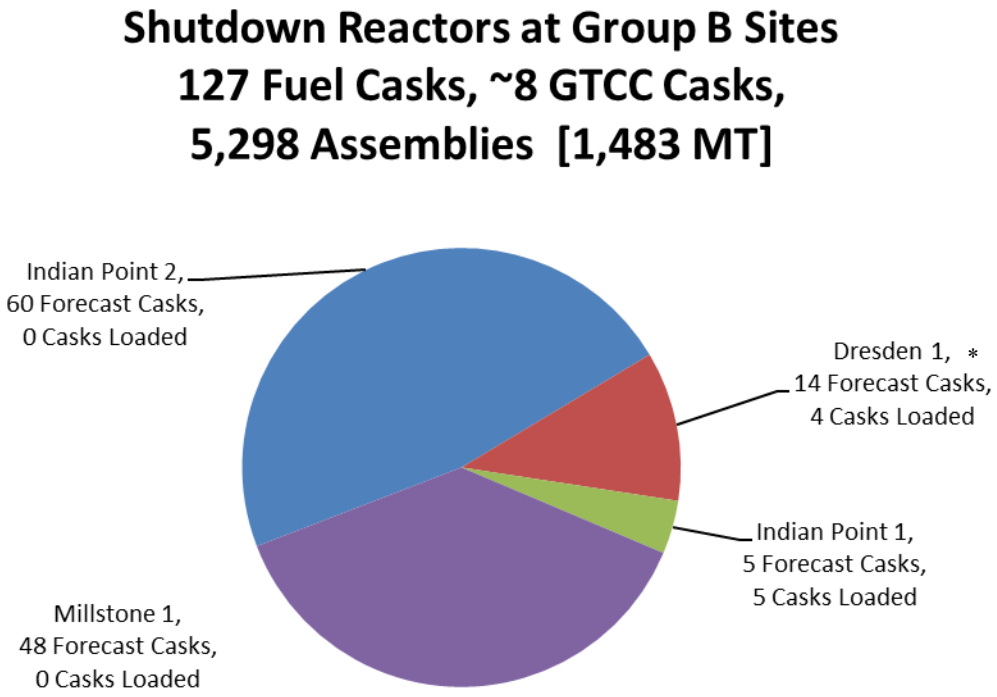
Figure 2-10. Dry SNF Storage at Group C Sites with Announced Early Shutdown Dates

Table 2-10. SNF and Stored GTCC LLRW from Shutdown Reactors at Group B Sites

		Discharges as of 12/31/2017		Transferred to Morris (Group F Site)		Discharges from 1/1/2018 to 12/31/2020		Projected Remaining Onsite Inventory at the end of 2020					
Reactor [Unit]	Shutdown Date	Assemblies	Initial Uranium (MT)	Assemblies	Initial Uranium (MT)	Assemblies	Initial Uranium (MT)	Assemblies	Initial Uranium (MT)	SNF Casks Loaded / Estimated		GTCC LLRW Casks** Loaded / Estimated	
Dresden 1*	10/31/1978	892	90.87	3	0.26	-	-	889	90.60	4	14	-	2
Indian Point 1	10/31/1974	160	30.58	-	0.00	-	-	160	30.58	5	5	-	2
Indian Point 2**	4/30/2020	1,698	770.51	-	0.00	284	128.62	1,982	899.14	-	60	-	2
Millstone 1	7/21/1998	2,884	525.62	-	0.00	-	-	2,884	525.62	-	48	-	2
Totals		**5,634**	**1,417.59**	**3**	**0.26**	**284**	**128.62**	**5,915**	**1,545.95**	**9**	**127**	**-**	**8**

* 617 Dresden 1 assemblies (~63.2MTU) are co-mingled with unit 2 and 3 SNF. This SNF is being moved to dry canister storage in a co-mingled fashion.

** For simplicity GTCC Casks are estimated at 2 per reactor unless decommissioning is complete. More detailed information on estimates of GTCC LLRW can be found in [DOE, 2016] and supporting documentation.



* 617 Dresden 1 assemblies (~63.2MTU) are co-mingled with unit 2 and 3 fuel are excluded from this Figure. Casks containing Indian Point Unit 2 SNF are included with Unit 3

Figure 2-11. Dry SNF Storage from Shutdown Reactors at Group B Sites

2.1.3 Shutdown Reactor SNF as of 6/30/2021

Indian Point Unit 3 in New York shut down on 4/30/2021, and although after the data date for this report, the shutdown has an immediate impact on the shutdown reactor SNF by moving 3 reactors on a single site to the shutdown category. Although this section discusses this impact, the remainder of the report uses a common data date of 12/31/2020.

The net effect of this impact is to add nearly 4000 assemblies in 120 casks containing almost 1,775 MTU to the shutdown category with reductions in the quantity of SNF shown in Table 2-9 for the announced shutdown reactors and shown in Table 2-10 for shutdown reactors on sites with continuing nuclear operations. Table 2-11 and Figure 2-13 provides "Post 2000" shutdown reactor site details as of 6/30/2021. Table 2-12 provides the changes in the Announced Reactor inventory, and Table 2-13 provides the changes in the shutdown reactor inventory at sites with continuing nuclear operations as of 6/30/2021.

With the Indian Point site reactors shutdown, the shutdown site inventory in 2025 (including both currently shutdown reactors and announced shutdown reactors, exclusive of shutdown reactors on sites with continuing nuclear operations) will be approximately 43,775 assemblies to be stored in approximately 1,118 casks, containing nearly 14,250 MTU, and between 16 (existing) and 33 GTCC casks depending upon reactor decommissioning progress. Figure 2-13 details the shutdown reactor SNF in 2025.

Table 2-11. SNF and Stored GTCC LLRW from Group A Sites Shutdown Post 2000 as of 6/30/2021

		Discharges as of 12/31/2017†		Forecast Discharges 1/1/2018 to 6/30/2021		Total Projected Discharged SNF through 6/30/2021†					
Reactor [Unit]	Shutdown Date	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	SNF Casks Loaded / Estimated		GTCC LLRW Casks Loaded / Estimated**	
Duane Arnold	10/12/2020	3,128	566	520	94	3,648	660	30	60	-	2
Crystal River 3	2/20/2013	1,243	582	-	-	1,243	582	39	39	-	2
Fort Calhoun	10/24/2016	1,264	466	-	-	1,264	466	40	40	-	2
Kewaunee	5/7/2013	1,335	519	-	-	1,335	519	38	38	-	2
Oyster Creek	9/25/2018	3,944	701	560	96	4,504	797	34	74	-	2
Pilgrim	5/31/2019	3,533	630	580	101	4,113	731	28	61	-	2
San Onofre	various	3,855	1,609	-	-	3,855	1,609	123	123	1	5
Three Mile Island 1	9/20/2019	1,486	700	177	85	1,663	786	-	45	-	2
Vermont Yankee	12/29/2014	3,879	706	-	-	3,879	706	58	58	-	2
Indian Point	various	3,426	1,516	571	258	3,997	1,773	52	125	-	6
Totals		**27,093**	**7,996**	**2,408**	**634**	**29,501**	**8,629**	**442**	**663**	**1**	**27**

† These inventory data reflect SNF assembly transfers.

**For simplicity GTCC Casks are estimated at 2 per reactor unless decommissioning is complete. More detailed information on estimates of GTCC LLRW can be found in [DOE, 2016] and supporting documentation.

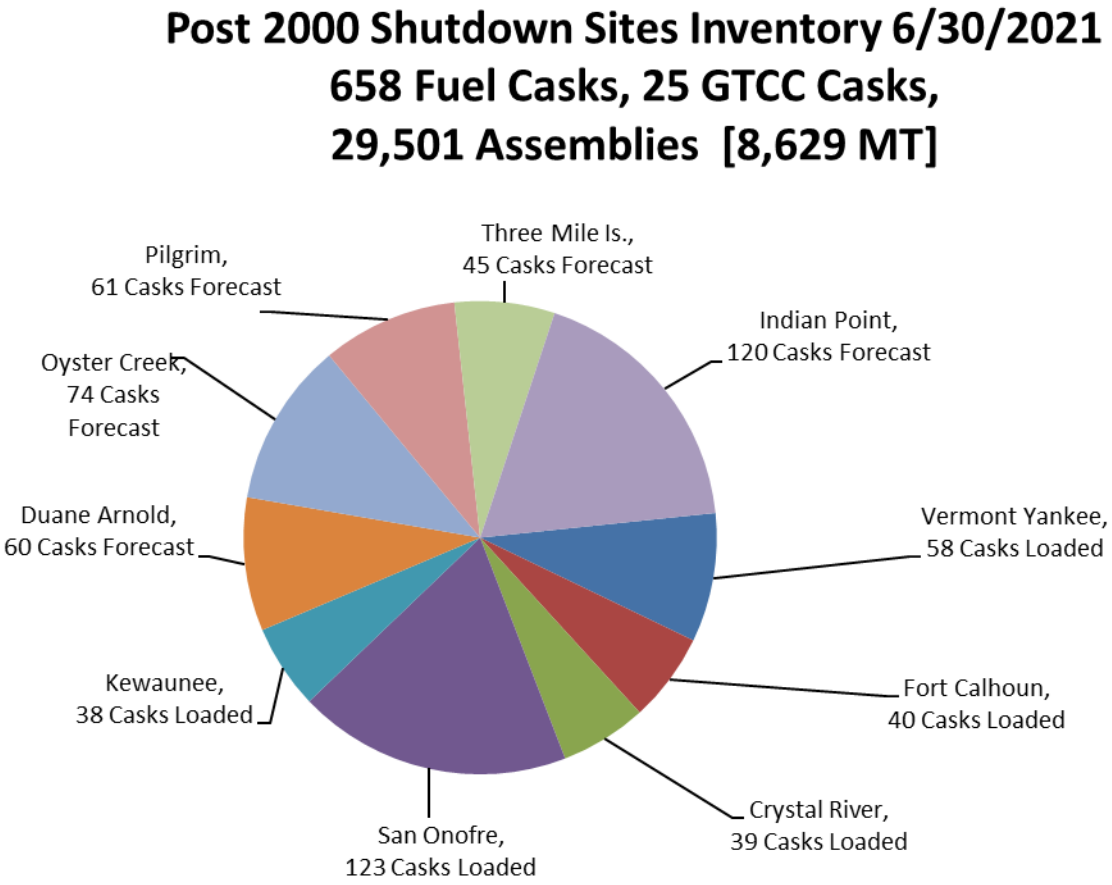


Figure 2-12. Dry SNF Storage at Group A Sites Shutdown Post 2000 as of 6/30/2021

Table 2-12. SNF and Stored GTCC LLRW from Groups B&C Sites with Announced Early Shutdown Dates as of 12/31/2025

		Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2025		Total Projected Discharged SNF through 12/31/2025					
Reactor [Unit]	Announced Shutdown Date	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	SNF Casks Loaded / Estimated		GTCC LLRW Casks Loaded / Estimated*	
Palisades	4/30/2022	1,701	699	128	55	2,097	869	49	57	-	2
Diablo Canyon 1	11/2/2024	1,680	723	186	79	2,245	962	58**	71	-	2
Diablo Canyon 2	8/26/2025	1,608	692	188	80	2,271	973		71	-	2
Totals		**4,989**	**2,114**	**502**	**214**	**6,613**	**2,804**	**107**	**199**	**-**	**6**

* For simplicity GTCC Casks are estimated at 2 per reactor unless decommissioning is complete. More detailed information on estimates of GTCC LLRW can be found in [DOE, 2016] and supporting documentation.

** Site total canisters from both units included.

Table 2-13. SNF and Stored GTCC LLRW from Shutdown Reactors at Group B Sites as of 6/30/2021

		Discharges as of 12/31/2017		Transferred to Morris (Group F Site)		Discharges from 1/1/2018 to 12/31/2020		Projected Remaining Onsite Inventory at the end of 2020					
Reactor [Unit]	Shutdown Date	Assemblies	Initial Uranium (MT)	Assemblies	Initial Uranium (MT)	Assemblies	Initial Uranium (MT)	Assemblies	Initial Uranium (MT)	SNF Casks Loaded / Estimated		GTCC LLRW Casks** Loaded / Estimated	
Dresden 1*	10/31/1978	892	90.87	3	0.26	-	-	889	90.60	4	14	-	2
Millstone 1	7/21/1998	2,884	525.62	-	-	-	-	2,884	525.62	-	48	-	2
Totals		**3,776**	**616**	**3**	**-**	**-**	**-**	**3,773**	**616**	**4**	**62**	**-**	**4**

* 617 Dresden 1 assemblies (~63.2MTU) are co-mingled with unit 2 and 3 SNF. This SNF is being moved to dry canister storage in a co-mingled fashion.

** For simplicity GTCC Casks are estimated at 2 per reactor unless decommissioning is complete. More detailed information on estimates of GTCC LLRW can be found in [DOE, 2016] and supporting documentation.

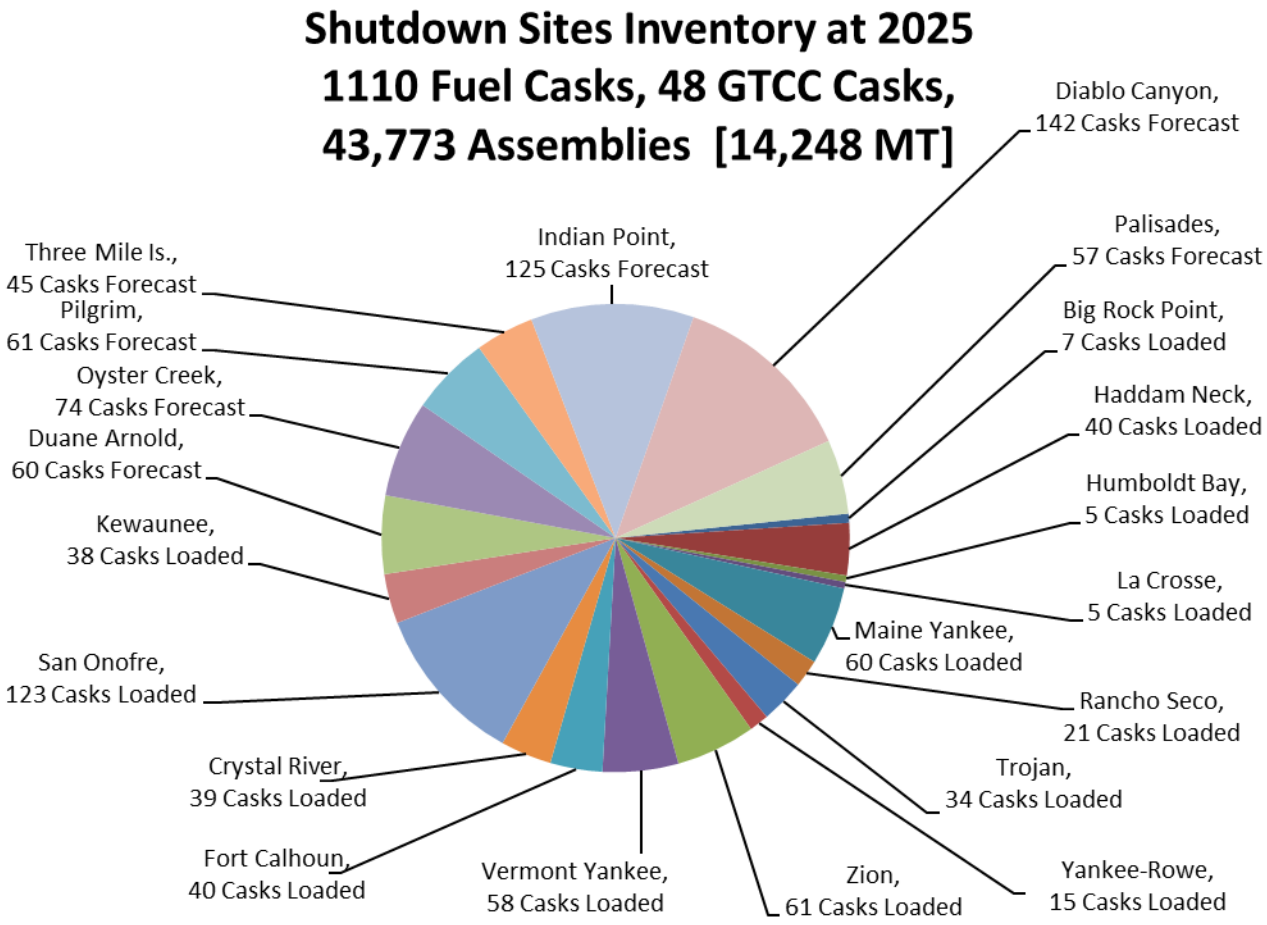


Figure 2-13. Shutdown Site Inventory at 2025 Including Indian Point

2.2 Future LWR SNF Inventory Forecast

The methods outlined above (Section 2.1) have been extended to provide the individual NPR forecasts inventory. Such forecasts vary with the estimation method parameters described above, and also with scenario specific details. Multiple scenarios have been included in the current revision of this report, as described herein. The reference projection scenario is described in the next section and assumes no new reactors and 60 or 80 (depending upon the renewal status) years of operation for existing reactors, when early shutdowns have not been announced.

2.2.1 Reference Scenario: No Replacement Nuclear Power Generation

The "No Replacement Nuclear Power Generation" scenario assumes no new NPRs are constructed and operated. This is the Reference Scenario for the purpose of comparison to alternative scenarios. The inventory for this initial scenario includes the SNF discharged from the 25 shutdown LWRs and the 94 currently operating LWRs listed in Table 2-1. Eighty-four of the 94 operating LWRs are assumed to have one 20 year life extension and will be decommissioned after 60 years of operation. Six reactors (Turkey Creek Units 3 and 4, Peach Bottom Units 2 and 3, and Surry Units 1 and 2) have received a "subsequent" or second 20 year license extension and will operate for 80 years.

Four operating LWRs have utility-announced early shutdown dates as indicated:

- Indian Point Unit 3, 2021[e]
- Palisades, 2022
- Diablo Canyon Unit 1, 2024
- Diablo Canyon Unit 2, 2025

Applying these assumptions, the last nuclear generator finishes operations in 2075 (Watts Bar Unit 2).

Table 2-14 provides the scenario inventory by reactor type as a function of the estimate phase. Actual quantities are used for discharges through December 31, 2017, forecast discharges are used for the individual reactors for later time periods.

The scenario totals nearly 475,200 assemblies containing nearly 138,000 MTU.

Table 2-15 provides the scenario inventory detailed to provide actual discharges through December 31, 2017 from the GC-859 database, the projected quantities between 1/1/2018 and 12/31/2020, and between 1/1/2021 and the end of the scenario, by major storage location category and by site Group. Table 2-15 excludes discharges that were reprocessed at West Valley, NY, and transfers to DOE for research and development purposes and therefore represents the quantity of SNF stored at the 119 power reactor sites and the away-from-reactor pool storage location at Morris, IL.

Figure 2-14 provides the reference scenario quantities at two points in time assuming a consolidated interim storage facility and/or repository is not available before 2045.

Figure 2-15 provides the Reference Scenario including the historical and forecast SNF discharges and the historical and forecast dry storage canister/casks assuming a consolidated interim storage facility and/or repository is not available before the end of the scenario.

[e] Indian Point Unit 3 was shutdown on 4/30/2020.

Figures 2-16 and 2-17 provide the burn-up distribution and initial enrichment distribution, respectively, for the Reference Scenario.

Figure 2-18 shows the estimated annual average Burn-up (GWd/MT) and the initial enrichment (% U-235) between 1968 and 2060.

Figure 2-19 provides the estimated Burn-up (GWd/MT) distribution based on assembly counts for the PWR and BWRs.

Figure 2-20 provides the estimated Burn-up (GWd/MT) distribution based on the initial uranium mass(MTU) for the PWR and BWRs.

Appendix C, Tables C-1 through C-5 provides additional details for this Reference Scenario on a reactor specific basis. Appendix C is discharged SNF information and does not reflect transfers.

Appendices D and E provide summary information for the Reference Scenario by state, and by NRC Region, respectively.

Appendix F and H provides additional congressional district and state detail for the reference scenario and also DOE SNF and reprocessing waste. Appendix H also provides SNF discharges by reactor before and after transfers reflecting the actual or estimated quantities in storage for a given site, Congressional District or state.

Table 2-14. Projected NPR SNF Inventory for the Reference Scenario by Reactor Type*

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/18 to 12/31/20		Forecast Discharges 1/1/21 to 12/31/75		Total Projected Discharged SNF	
Reactor Type	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**
PWR	119,338	51,808	9,867	4,355	76,218	33,715	205,423	89,878
BWR	157,774	28,090	13,490	2,402	98,500	17,621	269,764	48,113
Totals	**277,112**	**79,898**	**23,357**	**6,757**	**174,718**	**51,336**	**475,187**	**137,991**

*Includes NPR SNF inventory at Morris and that was transferred to DOE sites, other than debris from TMI-2. (Not all SNF transferred to DOE is still in the form of SNF, some has been processed and vitrified.)

Table 2-15. Projected SNF Inventory at NPR and Morris for the Reference Scenario by Site Group (Group Status as of 12/31/2020)

Description	Site Group	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
		Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)
Operating Reactors at Group C Sites (86 Rx/51Sites)*	C	217,285	62,556	19,576	5,731	167,531	49,120	404,392	117,407
Operating Reactors at Group C Sites with Announced Shutdown Date (3 Rx/2 Sites)	C	4,989	2,115	502	213	1,122	476	6,613	2,804
Operating Reactors at Group B Sites (4 Rx/2 Sites)*	B	14,561	3,825	1,348	394	5,872	1,653	21,781	5,872
Operating Reactors at Group B Sites with Announced Shutdown Date (1 Rx/1 Site)	B	1,568	714	94	42	193	88	1,855	844
Shutdown Reactors at Group B Sites (4 Rx/3 Sites)	B	3,933	647	0	0	0	0	3,933	647
Reactors Shutdown Since 2000 (11 Rx/9Sites)	A	23,667	6,480	1,837	376	0	0	25,504	6,856
Reactors Shutdown Prior to 2000 (10 Rx/9 Sites)	A	7,659	2,815	0	0	0	0	7,659	2,815
Away-from-Reactor Storage	F	3,217	674	0	0	0	0	3,217	674
Totals		**276,879**	**79,825**	**23,357**	**6,757**	**174,718**	**51,336**	**474,954**	**137,918**

* Excludes reactors with announced early shutdowns.

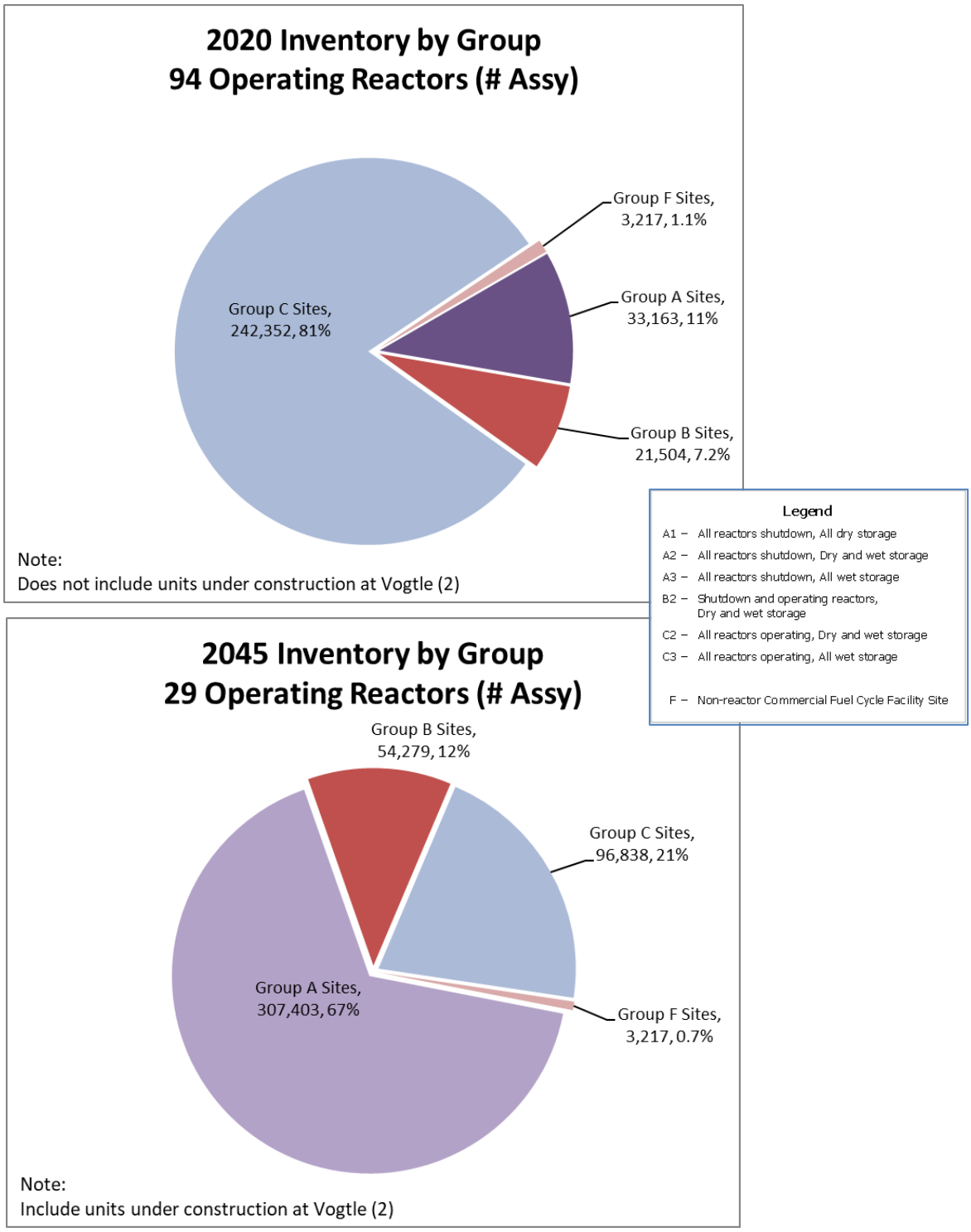


Figure 2-14. Projected Change in Distribution of Nuclear Power Reactor SNF by Group with Time (without interim storage facility or repository available before 2045)

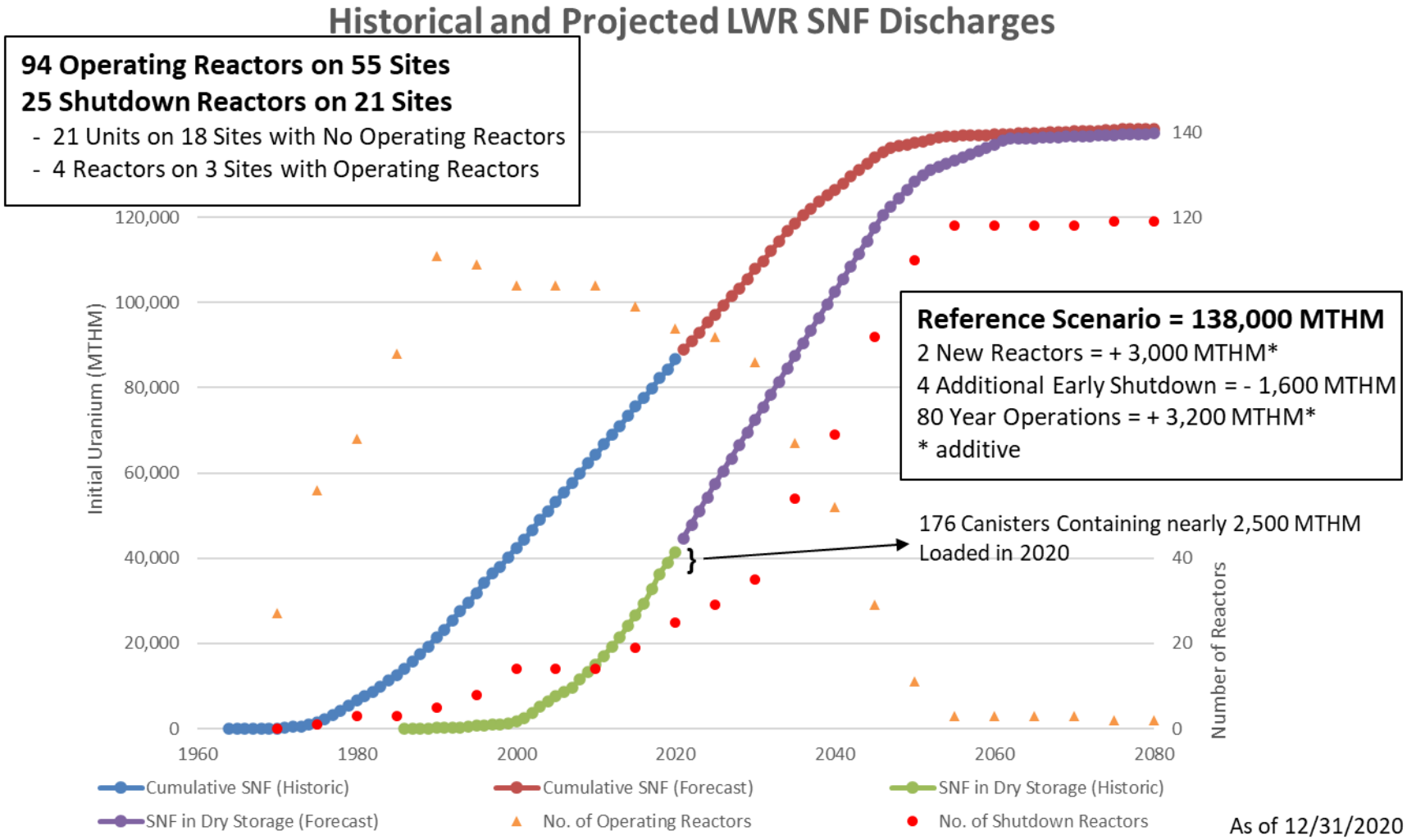


Figure 2-15 Reference Scenario Nuclear Power Reactor SNF Forecast

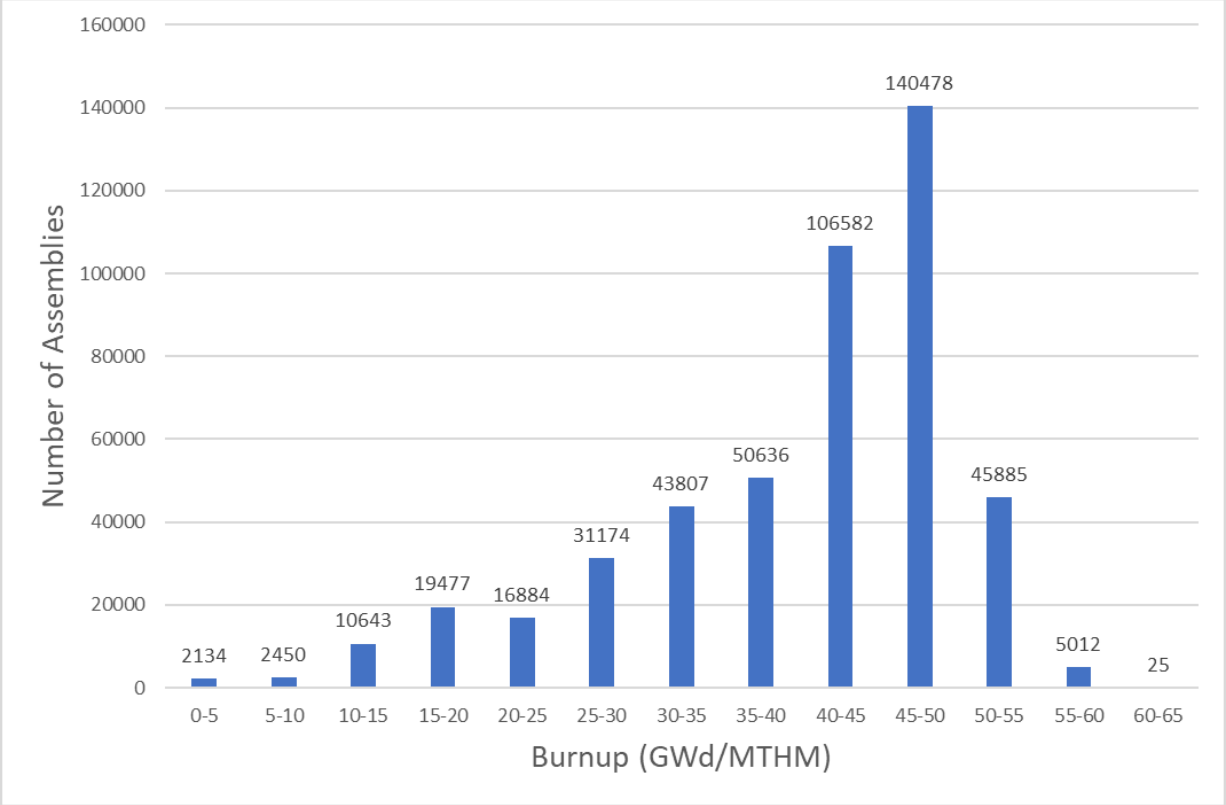


Figure 2-16 Reference Scenario SNF Burn-up Distribution

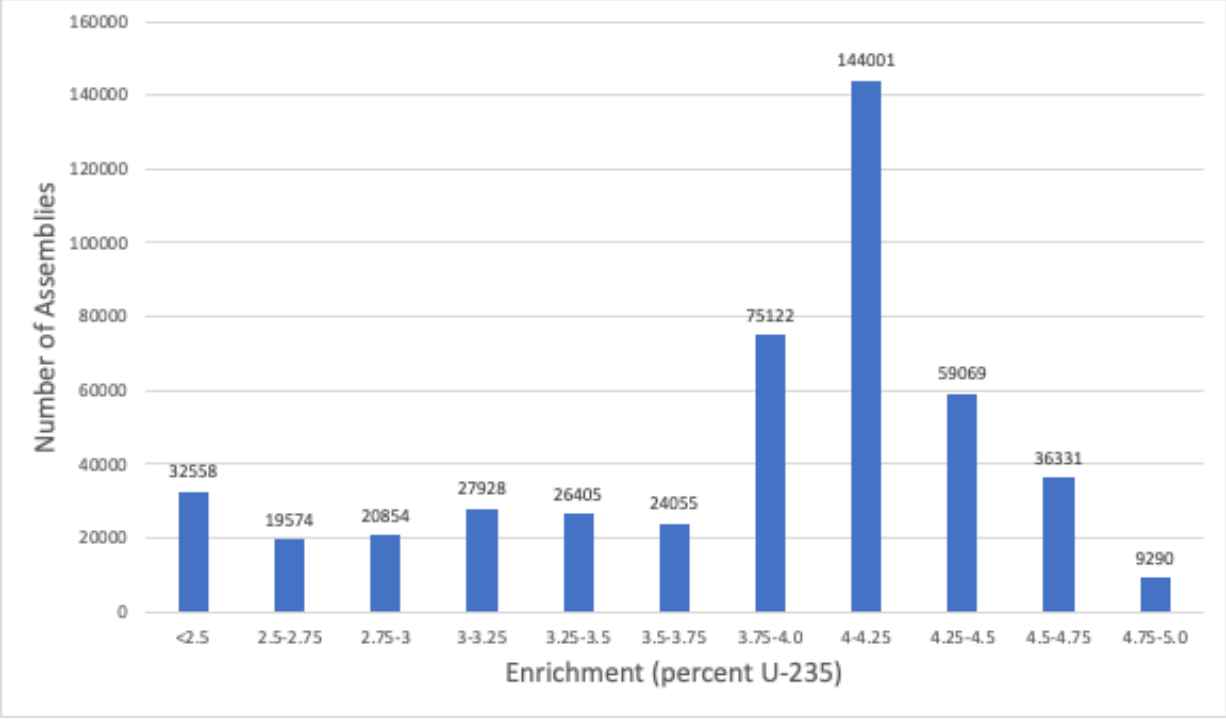


Figure 2-17 Reference Scenario Initial Enrichment Distribution for SNF Assemblies

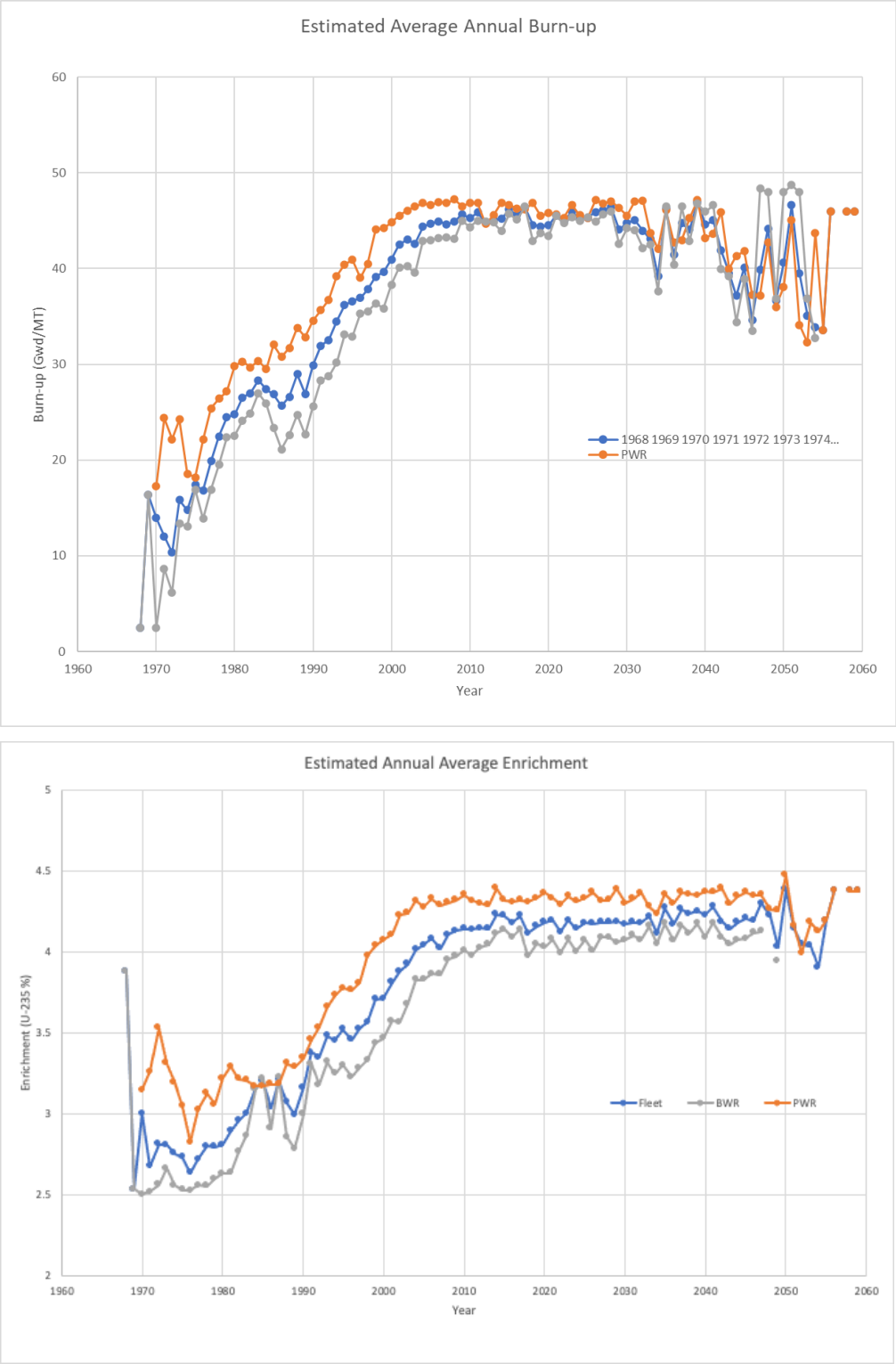


Figure 2-18 Estimated Average Annual Burn-up (GWd/MT) and Enrichment (U-235%) Through 2075

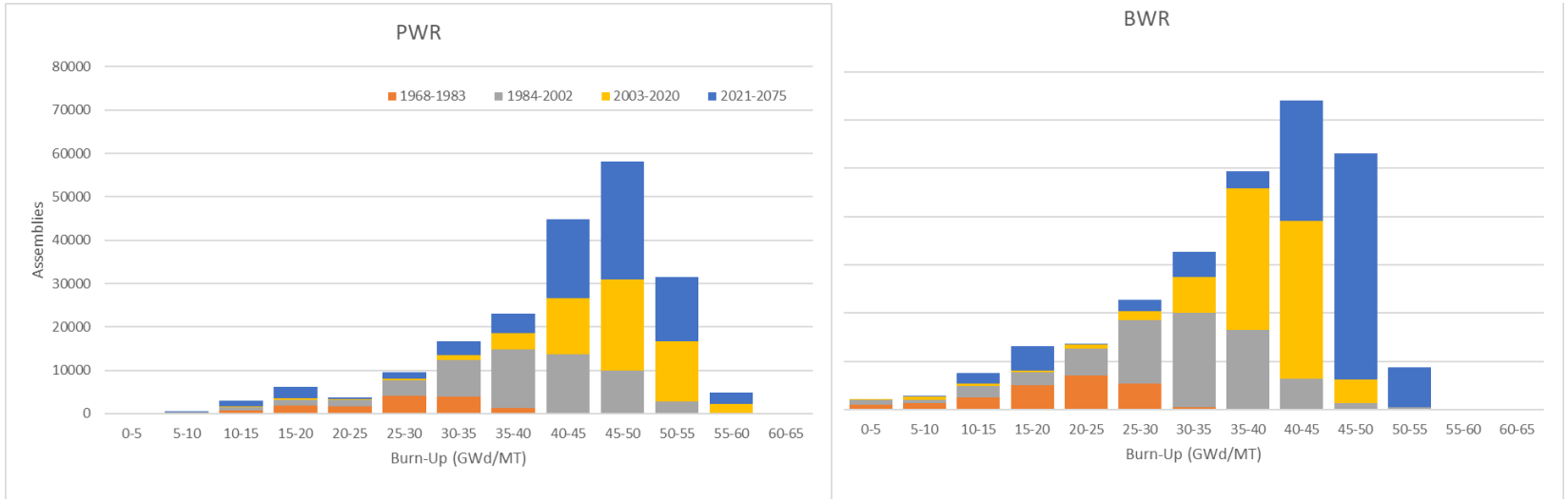


Figure 2-19 Estimated Burn-up (GWd/MTHM) Distribution by Assembly Count for SNF Through December 2075

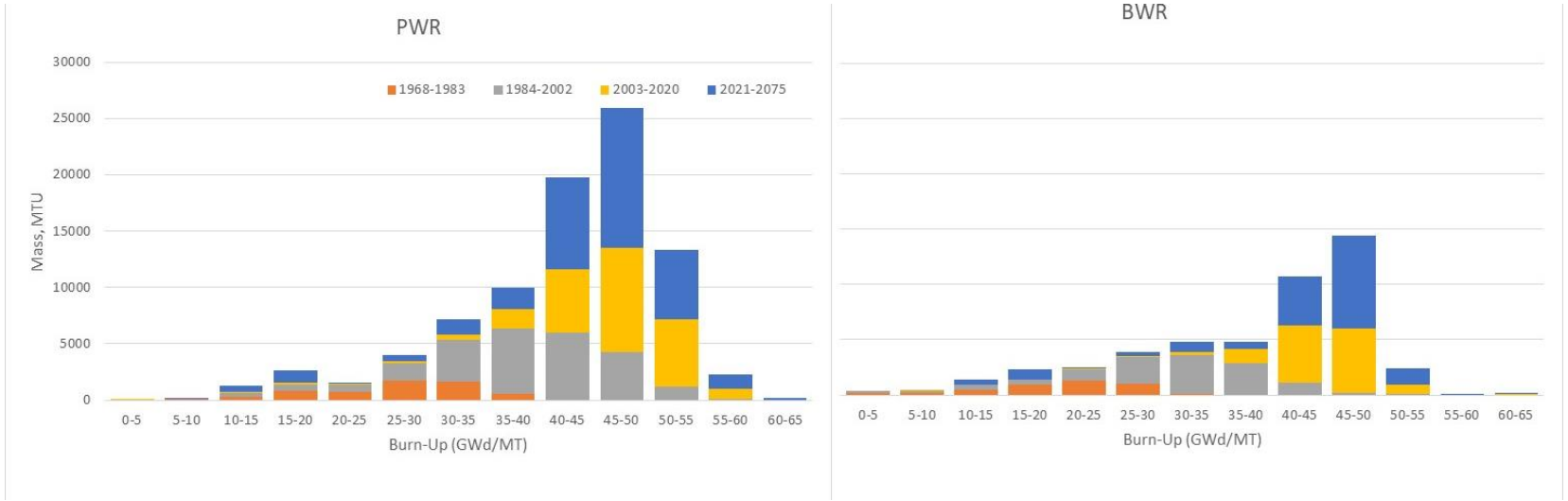


Figure 2-20 Estimated Burn-up (GWd/MTHM) Distribution by Initial Uranium Mass for SNF Through December 2075

2.2.2 Alternative Scenario 1: Addition of "New Builds"

Alternative Scenario 1 is based on the Reference Scenario with the addition of two "New Builds". This scenario has the same underlying assumptions that characterize the Reference Scenario with the additional assumption that two reactors that are currently under construction come online and begin discharging SNF over the next two years. For the purpose of the current revision to this report, these reactors, Vogtle, Units 3 & 4, are assumed to operate for 60 years. No other modifications to the Reference Scenario assumptions are made for this alternative scenario.

Table 2-16 provides the scenario inventory by reactor type as a function of the estimate phase. Actual quantities are used for discharges prior to 12/31/2017. Forecast discharges are used for the individual reactors for later time periods.

Table 2-17 provides the scenario inventory detailed to provide actual discharges through December 31, 2017 from the GC-859 database and the projected quantities between 1/1/2018 and 12/31/2020, and between 1/1/2021 and the end of the scenario (2083), by major storage location category and by site Group. One additional category beyond the Reference Scenario is included:

- "New Builds" includes two new reactors at an existing site in Georgia. Table 2-18 provides details of the projected discharges from these reactors.

The scenario totals approximately 482,360 assemblies containing approximately 141,030 MTU. The assumptions in this scenario are projected to generate an additional 7,170 SNF assemblies and approximately 3,030 MTU beyond that of the Reference Scenario.

Table 2-16. Projected NPR SNF Inventory for Alternative Scenario 1 by Reactor Type*

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/18 to 12/31/20		Forecast Discharges 1/1/21 to 12/31/83		Total Projected Discharged SNF	
Reactor Type	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**
PWR	119,338	51,808	9,867	4,355	83,390	36,749	212,595	92,912
BWR	157,774	28,090	13,490	2,402	98,500	17,621	269,764	48,113
Totals	**277,112**	**79,898**	**23,357**	**6,757**	**181,890**	**54,370**	**482,359**	**141,025**

* Includes NPR SNF inventory at Morris and that was transferred to DOE sites, other than debris from TMI-2. (Not all SNF transferred to DOE is still in the form of SNF, some has been processed and vitrified.)

Table 2-17. Projected SNF Inventory at NPR and Morris for Alternative Scenario 1 by Site Group (Group Status as of 12/31/2020)

Description	Site Group	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Discharges 1/1/2021 to 12/31/2082		Total Projected Discharged SNF	
		Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)
Operating Reactors at Group C Sites (86 Rx/51Sites)*	C	217,285	62,556	19,576	5,731	167,531	49,120	404,392	117,407
Operating Reactors at Group C Sites with Announced Shutdown Date (3 Rx/2 Sites)	C	4,989	2,115	502	213	1,122	476	6,613	2,804
Operating Reactors at Group B Sites (4 Rx/2 Sites)*	B	14,561	3,825	1,348	394	5,872	1,653	21,781	5,872
Operating Reactors at Group B Sites with Announced Shutdown Date (1 Rx/1 Site)	B	1,568	714	94	42	193	88	1,855	844
Shutdown Reactors at Group B Sites (4 Rx/3 Sites)	B	3,933	647	0	0	0	0	3,933	647
Reactors Shutdown Since 2000 (11 Rx/9Sites)	A	23,667	6,480	1,837	376	0	0	25,504	6,856
Reactors Shutdown Prior to 2000 (10 Rx/9 Sites)	A	7,659	2,815	0	0	0	0	7,659	2,815
Away-from-Reactor Storage	F	3,217	674	0	0	0	0	3,217	674
New Builds (4 Rx/2 Sites)		0	0	0	0	7,172	3,034	7,172	3,034
Totals		**276,879**	**79,825**	**23,357**	**6,757**	**181,890**	**54,370**	**482,126**	**140,952**

* Excludes reactors with announced early shutdowns.

Table 2-18. Projected SNF Inventory for Assumed "New Builds"

Reactor [Unit]	Assumed Startup Year	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2082		Total Projected Discharged SNF	
		Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Initial Uranium (MT)
Vogtle 3	2022	-	-	-	-	3,586	1,517	3,586	1,517
Vogtle 4	2023	-	-	-	-	3,586	1,517	3,586	1,517
Totals		**-**	**-**	**-**	**-**	**7,172**	**3,034**	**7,172**	**3,034**

2.2.3 Alternative Scenario 2: Early Shutdown of Byron and Dresden Reactors

Alternative Scenario 2 was examined in early 2021 and assumed that the Byron and Dresden reactors shut down according to dates announced at the time. Since then, the utility operator for these plants has decided to keep these reactor units operating. The scenario was retained in this report to provide an example illustrating the potential affect early shutdowns could have on future SNF inventory projections. The announced shutdown dates were:

- Dresden Unit 2, November 1, 2021
- Dresden Unit 3, November 1, 2021
- Byron Unit 1, September 14, 2021
- Byron Unit 2, September 16, 2021

Table 2-19 provides the scenario inventory by reactor type as a function of the estimate phase. Actual quantities are used for discharges to December 31, 2017. Forecast discharges are used for the individual reactors for later time periods.

Table 2-20 provides the scenario inventory detailed to provide actual discharges through December 31, 2017 from the GC-859 database and the projected quantities between 1/1/2018 and 12/31/2020, and between 1/1/2021 and the end of the scenario (2075), by major storage location category and by site Group.

The scenario totals approximately 470,200 assemblies containing 136,400 MTU. The assumptions in this scenario are projected to result in a reduction of 4,975 SNF assemblies totaling -1,590 MTU relative to the projections of the Reference Scenario.

The early shutdowns would have increased the total quantity of SNF at shutdown reactor sites by moving 5 reactors on two sites to the shutdown category. The net effect is to add over 16,000 assemblies in 323 casks containing almost 4,000 MTU to the shutdown category. Table 2-21 provides post 2000 shutdown reactor site details as of 12/31/2021 for this scenario.

Including Byron and Dresden, the shutdown site inventory in 2025 (currently shutdown and announced shutdown reactors, exclusive of shutdown reactors on sites with continuing nuclear operations) would be approximately 60,850 assemblies to be stored in approximately 1,433 casks, containing nearly 18,240 MTU, and between 16 (existing) and 58 GTCC casks depending upon reactor decommissioning progress. Figure 2-21 details the shutdown reactor SNF in 2025.

Table 2-19. Projected NPR SNF Inventory for Alternative Scenario 2 by Reactor Type*

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/18 to 12/31/20		Forecast Discharges 1/1/21 to 12/31/75		Total Projected Discharged SNF	
Reactor Type	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**
PWR	119,338	51,808	9,867	4,355	73,232	32,470	202,437	88,633
BWR	157,774	28,090	13,490	2,402	96,512	17,277	267,776	47,769
Totals	**277,112**	**79,898**	**23,357**	**6,757**	**169,744**	**49,748**	**470,213**	**136,403**

* Includes NPR SNF inventory at Morris and that was transferred to DOE sites, other than debris from TMI-2. (Not all SNF transferred to DOE is still in the form of SNF, some has been processed and vitrified.)

Table 2-20. Projected SNF Inventory at NPR and Morris for Alternative Scenario 2 by Site Group (Group Status as of 12/31/2020)

Description	Site Group	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
		Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)
Operating Reactors at Group C Sites (86 Rx/51Sites)*	C	217,285	62,556	19,576	5,731	164,545	47,877	401,406	116,164
Operating Reactors at Group C Sites with Announced Shutdown Date (3 Rx/2 Sites)	C	4,989	2,115	502	213	1,122	476	6,613	2,804
Operating Reactors at Group B Sites (4 Rx/2 Sites)*	B	14,561	3,825	1,348	394	3,884	1,309	19,793	5,528
Operating Reactors at Group B Sites with Announced Shutdown Date (1 Rx/1 Site)	B	1,568	714	94	42	193	88	1,855	844
Shutdown Reactors at Group B Sites (4 Rx/3 Sites)	B	3,933	647	0	0	0	0	3,933	647
Reactors Shutdown Since 2000 (11 Rx/9Sites)	A	23,667	6,480	1,837	376	0	0	25,504	6,856
Reactors Shutdown Prior to 2000 (10 Rx/9 Sites)	A	7,659	2,815	0	0	0	0	7,659	2,815
Away-from-Reactor Storage	F	3,217	674	0	0	0	0	3,217	674
Totals		**276,879**	**79,825**	**23,357**	**6,757**	**169,744**	**49,750**	**469,980**	**136,332**

* Excludes reactors with announced early shutdowns.

Table 2-21. SNF and Stored GTCC LLRW from Group A Sites Shutdown Post 2000 Including Indian Point, Byron and Dresden

		Discharges as of 12/31/2017†		Forecast Discharges 1/1/2018 to 12/31/2021		Total Projected Discharged SNF through 12/31/2021†					
Reactor [Unit]	**Shutdown Date**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**SNF Casks Loaded / Estimated**		**GTCC LLRW Casks Loaded / Estimated****	
Duane Arnold	10/12/2020	3,128	566	520	94	3,648	660	30	60	-	2
Crystal River 3	2/20/2013	1,243	582	-	-	1,243	582	39	39	-	2
Fort Calhoun	10/24/2016	1,264	466	-	-	1,264	466	40	40	-	2
Kewaunee	5/7/2013	1,335	519	-	-	1,335	519	38	38	-	2
Oyster Creek	9/25/2018	3,944	701	560	96	4,504	797	34	74	-	2
Pilgrim	5/31/2019	3,533	630	580	101	4,113	731	28	61	-	2
San Onofre	various	3,855	1,609	-	-	3,855	1,609	123	123	1	5
Three Mile Island 1	9/20/2019	1,486	700	177	85	1,663	786	-	45	-	2
Vermont Yankee	12/29/2014	3,879	706	-	-	3,879	706	58	58	-	2
Indian Point	various	3,426	1,516	571	258	3,997	1,773	52	125	-	6
Byron	9/2021	3,560	1,499	748	312	4,308	1,811	37	135	-	4
Dresden	11/2021	11,329	1,942	1,438	234	12,767	2,176	86	188	-	6
Totals		**43,062**	**11,436**	**3,514**	**1,180**	**46,576**	**12,616**	**565**	**986**	**1**	**37**

† These inventory data reflect SNF assembly transfers.

**For simplicity GTCC Casks are estimated at 2 per reactor unless decommissioning is complete. More detailed information on estimates of GTCC LLRW can be found in [DOE, 2016] and supporting documentation.

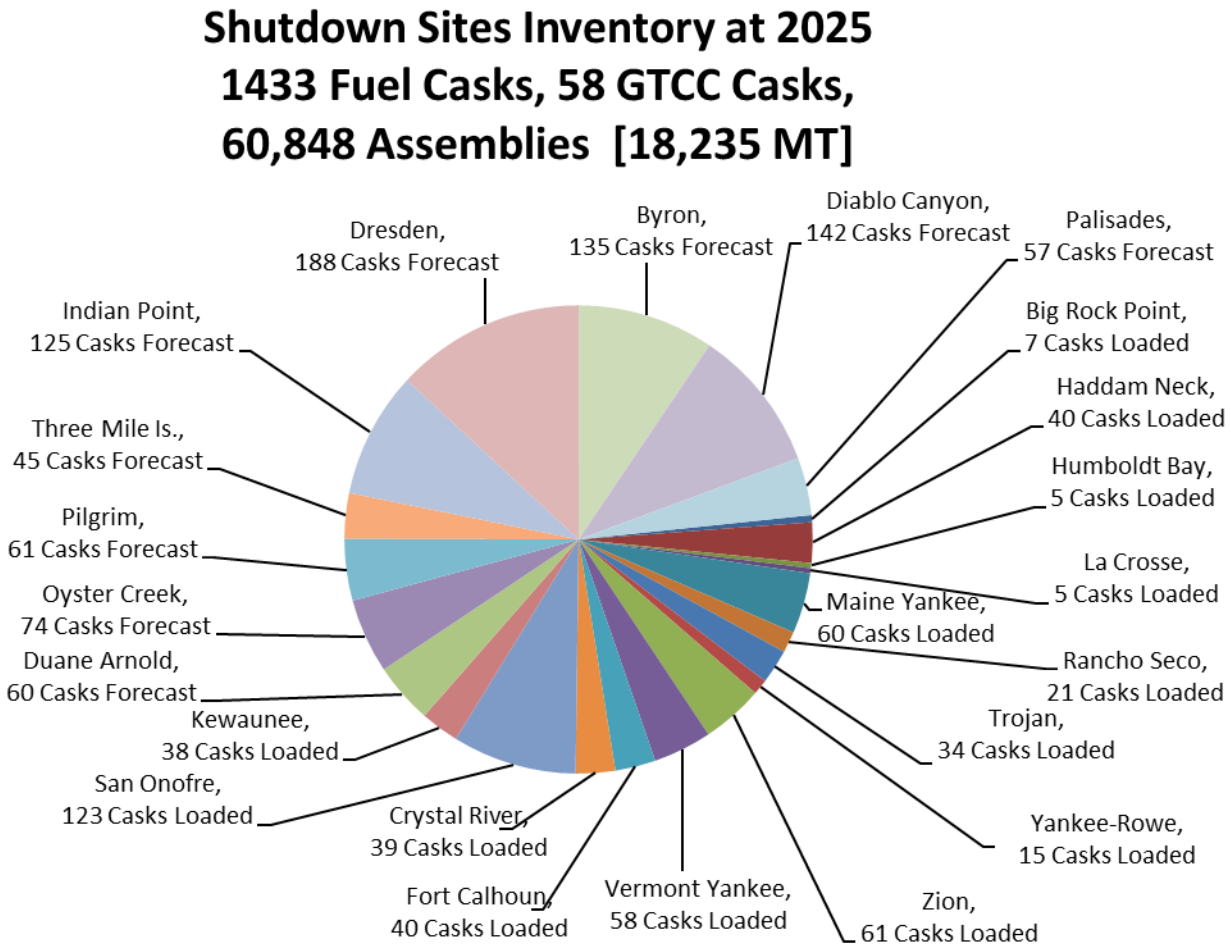


Figure 2-21. Shutdown Site Inventory at 2025 Including Indian Point, Bryon, Dresden

2.2.4 Alternative Scenario 3: "Subsequent" License Renewal

Alternative Scenario 3 provides the additional inventory from nine reactors which have applications pending or have expressed an intent to apply for NRC approval of a "subsequent" or an additional 20 year operating license renewal. These nine reactors are:

- North Anna 1 (application under review)
- North Anna 2 (application under review)
- Point Beach Unit 1 (application under review)
- Point Beach Unit 2 (application under review)
- Oconee 1 (expressed intent to apply)
- Oconee 2 (expressed intent to apply)
- Oconee 3 (expressed intent to apply)
- St. Lucie Unit 1 (expressed intent to apply)
- St. Lucie Unit 2 (expressed intent to apply)

Table 2-22 provides the scenario inventory by reactor type as a function of the estimate phase. Actual quantities are used for discharges to December 31, 2017. Forecast discharges are used for the individual reactors for later time periods.

Table 2-23 provides the scenario inventory detailed for actual discharges through December 31, 2017 from the GC-859 database; the projected quantities between 1/1/2018 and 12/31/2020; and the projected quantities between 1/1/2021 and the end of the scenario (2083), by major storage location category and by site Group.

The scenario totals approximately 482,660 assemblies containing 141,240 MTU. The assumptions in this scenario are projected to result in an increase of 7,480 SNF assemblies totaling 3,250 MTU relative to the projections of the Reference Scenario.

Table 2-22. Projected NPR SNF Inventory for Alternative Scenario 3 by Reactor Type*

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/18 to 12/31/2020		Forecast Discharges 1/1/21 to 12/31/83		Total Projected Discharged SNF	
Reactor Type	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**	**Assemblies**	**Initial Uranium (MT)**
PWR	119,338	51,808	9,867	4,355	86,695	36,961	212,900	93,124
BWR	157,774	28,090	13,490	2,402	98,500	17,621	269,764	48,113
Totals	**277,112**	**79,898**	**23,357**	**6,757**	**182,195**	**54,582**	**482,664**	**141,237**

* Includes NPR SNF inventory at Morris and that was transferred to DOE sites, other than debris from TMI-2. (Not all SNF transferred to DOE is still in the form of SNF, some has been processed and vitrified.)

Table 2-23. Projected SNF Inventory at NPR and Morris for Alternative Scenario 3 by Site Group (Group Status as of 12/31/2020)

Description	Site Group	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Discharges 1/1/2021 to 12/31/2082		Total Projected Discharged SNF	
		Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)
Operating Reactors at Group C Sites (86 Rx/51Sites)*	C	217,285	62,556	19,576	5,731	175,008	52,366	411,869	120,652
Operating Reactors at Group C Sites with Announced Shutdown Date (3 Rx/2 Sites)	C	4,989	2,115	502	213	1,122	476	6,613	2,804
Operating Reactors at Group B Sites (4 Rx/2 Sites)*	B	14,561	3,825	1,348	394	5,872	1,653	21,781	5,872
Operating Reactors at Group B Sites with Announced Shutdown Date (1 Rx/1 Site)	B	1,568	714	94	42	193	88	1,855	844
Shutdown Reactors at Group B Sites (4 Rx/3 Sites)	B	3,933	647	-	-	0	0	3,933	647
Reactors Shutdown Since 2000 (11 Rx/9Sites)	A	23,667	6,480	1,837	376	0	0	25,504	6,856
Reactors Shutdown Prior to 2000 (10 Rx/9 Sites)	A	7,659	2,815	-	-	0	0	7,659	2,815
Away-from-Reactor Storage	F	3,217	674	-	-	0	0	3,217	674
Totals		**276,879**	**79,825**	**23,357**	**6,757**	**182,188**	**54,580**	**482,431**	**141,164**

*** Excludes reactors with announced early shutdowns.**

2.2.5 Scenario Comparison Summary

The methods described previously have been extended to provide the forecast inventory based on a number of scenarios. Three alternative scenarios, in addition to the Reference Scenario have been included in the current report. A summary and comparison are provided in Table 2-24 to illustrate the impact of the scenario assumptions for each alternative scenario, relative to the Reference Scenario. The results of the alternative scenarios considered in this revision of the report indicate a potential inventory that would vary from the Reference Scenario by a reduction of nearly 5,000 assemblies (~1,590 MTU), in the case where Dresden and Byron reactors would have shutdown in 2021, to an increase of approximately 7,480 assemblies (~3,250 MTU), in the case where nine reactors have subsequent operating licenses approved

The cases can be combined such that a reasonable bounding inventory is anticipated from the reference scenario, the addition of two new builds and nine additional operating reactors obtain a subsequent 20-years license extension. This results in an inventory of ~489,840 assemblies containing ~144,270 MTU.

Table 2-24. Summary Table of Projected NPR SNF Inventory*

Scenario	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2083		Total Projected Discharged SNF		Delta from Reference	
	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)
Reference Scenario 60 Year Operation unless Announced Otherwise	277,112	79,898	23,357	6,757	174,718	51,336	475,187	137,991	0	0
Scenario 1 Addition of 2 New Builds	277,112	79,898	23,357	6,757	181,890	54,370	482,359	141,025	7,172	3,034
Scenario 2 Early Shutdown of Dresden and Byron in 2021	277,112	79,898	23,357	6,757	169,744	49,748	470,213	136,403	-4,974	-1,587
Scenario 3 9 Additional Reactors Obtaining a Second 20-year License Renewal	277,112	79,898	23,357	6,757	182,195	54,582	482,664	141,237	7,480	3,247

* Includes NPR SNF inventory at Morris and that was transferred to DOE sites, other than debris from TMI-2. (Not all SNF transferred to DOE is still in the form of SNF, some has been processed and vitrified.).

2.3 Spent Nuclear Fuel Dry Storage Systems

SNF is initially stored at the nuclear plants in water-filled pools. Most of these pools were not designed for long term storage and many facilities have run out of capacity to store all the SNF in their pools. At these facilities, dry storage systems are utilized to store the SNF. As more facilities run out of pool storage and as reactors continue to generate SNF, the amount of dry storage is increasing. As of December 31, 2020, 3,334 dry storage SNF casks have been loaded at NPR sites containing 142,595 SNF assemblies (~41,600 MT) (Table 2-6 and Appendix B). The distribution of SNF by storage method is provided in Figure 2-12, over 47% of the SNF assemblies are now in dry storage.

As of the end of 2020, only three sites (Three Mile Island [the only subgroup A3 site], Shearon Harris, and Wolf Creek) do not have dry storage capabilities. Dry storage operations at the South Texas Project began in early 2019. Three Mile Island and Wolf Creek have selected their dry storage technologies and initiated project activities, loading activities are expected to begin to 2021 (Wolf Creek) and 2022 (Three Mile Island). Shearon Harris will not require dry storage before the end of the current license.

In 2020, utilities loaded 176 dry storage canisters containing 8,290 assemblies, and nearly 2,500 MT of SNF. This is the lowest annual loading since 2013 and is likely the result of COVID-19 loading deferments. Annual loading is expected to increase in 2021 and 2022.

SNF storage methods have changed since its inception and today there are three broad categories of storage methods: SNF assemblies in heavy composite wall casks which provide integral confinement and shielding (often called bare fuel casks), SNF in welded steel canisters loaded into storage/transportation overpacks and SNF in welded steel canisters stored in vented concrete storage overpacks which provide shielding for the SNF canister pending transportation. Table 2-25 provides the distribution by storage method.

Table 2-25 Dry Storage Method Distribution

Storage Method	Canisters/Casks	Assemblies
Bare Fuel Casks	232	10,822
Welded Canister in Storage/Transportation Overpacks	12	866
Weld Canisters in Concrete Storage Overpacks/Modules	3,090	130,907
Total	**3,334**	**142,595**

Only 12 welded canisters already loaded in storage/transportation overpacks are in use at 3 sites. These systems are no longer being loaded. See Table 2-26.

Table 2-26 Welded SNF Canisters in Storage/Transportation Overpacks

Reactor, Unit	Canisters	Assemblies
Humboldt Bay	5	390
Dresden, 1	4	272
Hatch	3	204
Total	**12**	**866**

Bare Fuel Casks (BFCs) are still in use and are being routinely loaded at Prairie Island and Peach Bottom. Table 2-27 provides details on these canisters. There are currently 232 BFCs in use containing 10,822 assemblies.

Table 2-27 Bare Fuel Casks by Reactor Site and Cask Vendor/Model

Reactor, Vendor/Model	Canisters	Assemblies
Surry Castor	26	558
Surry MC-10	1	24
Surry NAC 128S/T	2	56
Surry TN-32	26	832
McGuire TN-32	10	320
North Anna TN-32	28	896
Prairie Island TN-40	29	1,160
Prairie Island TN-40HT	18	720
Peach Bottom TN-68	92	6,256
Total	**232**	**10,822**

The majority (over 91%) of the SNF in dry storage is in welded canisters stored in concrete overpacks. These dry storage systems are referred to as vented concrete casks or modules. Table 2-28 provides the vendor distribution.

Figure 2-22 summarizes the current composition of SNF dry storage systems.

Table 2-28 Welded Canisters in Concrete Storage Overpacks by Vendor

Vendor	Canisters	Assemblies
Holtec	1,413	70,844
NAC	467	13,474
Transnuclear	1,145	44,756
Westinghouse/other	65	1,833
Total	**3,090**	**130,907**

Table 2-29 to 2-31 provides the storage systems used at the Group A and Group B shutdown sites [Leduc, 2012 updated to reflect current knowledge]. These tables also provide the transportation cask status for the anticipated storage cask [Leduc, 2012 updated to reflect current knowledge]. Except for Millstone 1, all the reactor sites listed in these tables have implemented a dry storage system. All SNF from the shutdown Millstone 1 reactor is currently still in wet storage. Dry storage operations at Millstone have thus far been limited to discharges from the two operating PWRs at this site.

An additional six casks are currently stored on the cask pad and two casks containing SNF from West Valley are stored on rail cars at CPP-2707 at INL. The TMI-2 core debris is currently stored in 29 casks at the TMI-2 ISFSI, also at INL. The Fort St. Vrain ISFSI stores 1,464 SNF elements in 244 canisters in a vault type storage system near Platteville, Colorado.

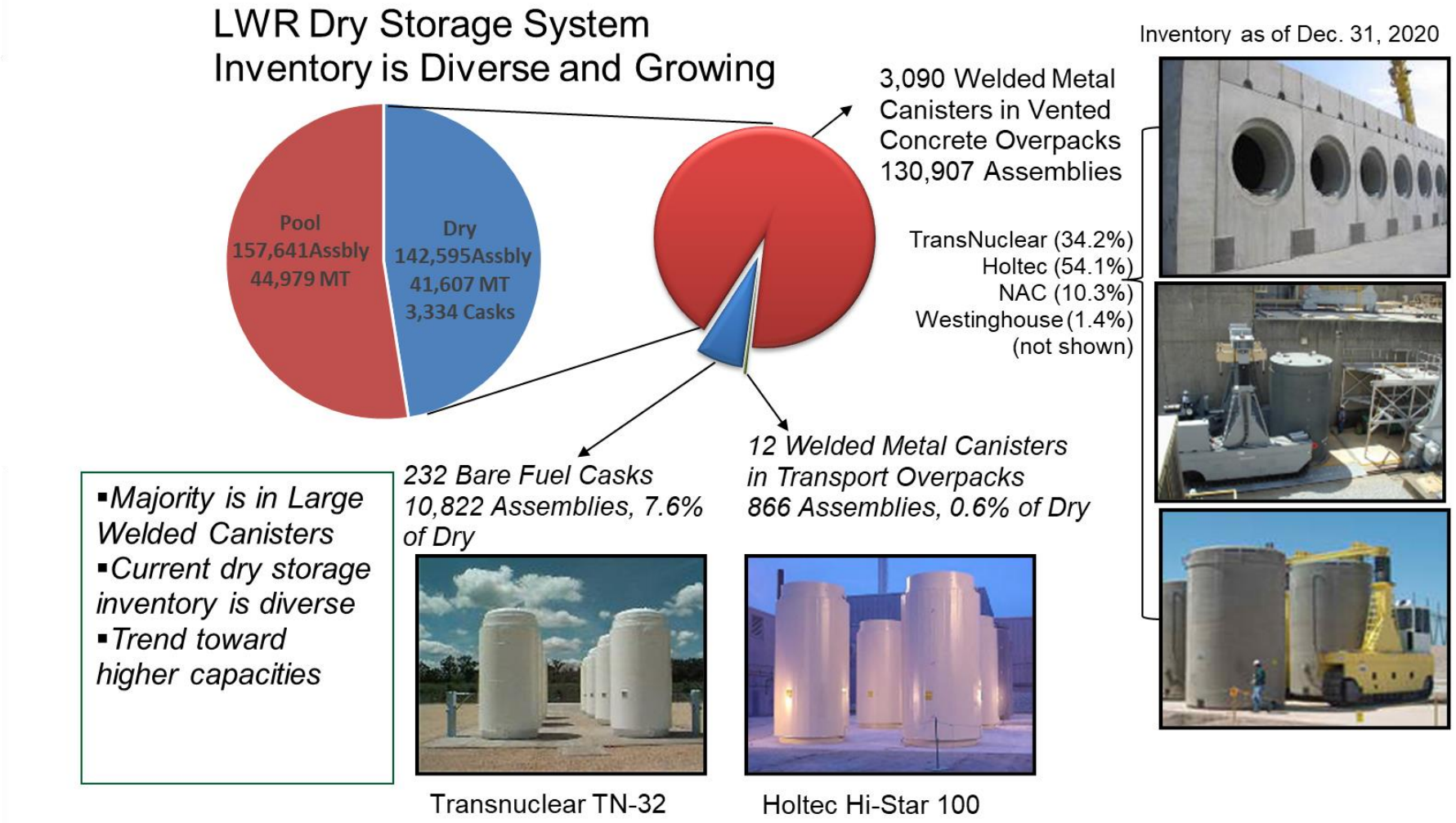


Figure 2-22SNF Dry Storage Summary

Table 2-29. Cask Systems Used at Group A Sites Shutdown Prior to 2000

Reactor [Unit]	Type	ISFSI Load Dates[a]	Storage System/Canisters	Transport Cask Status
Big Rock Point	BWR	12/2002-03/2003	Fuel Solutions W150 Storage Overpack W74 Canister	TS-125 (Docket No. 71-9276); Certificate expires 10/31/2022 None fabricated
Haddam Neck	PWR	05/2004-03/2005	NAC-MPC/CY-MPC (26 Assy) canister	NAC-STC (Docket No. 71-9235); Certificate expires 5/31/2024. Foreign use versions fabricated.
Humboldt Bay 3	BWR	08/2008-12/2008	Holtec HI-STAR HB/MPC-HB canister	HI-STAR HB (Docket No. 71-9261); Certificate expires 4/30/2024. SNF in canisters in fabricated casks. No impact limiters.
La Crosse	BWR	07/2012-09/2012	NAC MPC/LACBWR canister	NAC-STC (Docket No. 71-9235); Certificate expires 5/31/2024. Foreign use versions fabricated.
Maine Yankee	PWR	08/2002-03/2004	NAC-UMS/UMS-24 canister	NAC-UMS Universal Transport Cask (Docket No. 71-9270); Certificate expires 11/20/2020. None fabricated
Rancho Seco	PWR	04/2001-08/2002	TN Standardized NUHOMS/FO-DSC, FC-DSC, and FF DSC canisters	NUHOMS MP187 (Docket No. 71-9255); Certificate expires 11/30/2023. One cask fabricated. No impact limiters.
Trojan	PWR	12/2002-09/2003	TranStor Storage Overpack/Holtec MPC-24E and MPC-24EF canisters	HI-STAR 100 (Docket No. 71-9261) Certificate expires 4/30/2024. Units fabricated but dedicated to storage at other sites. No impact limiters
Yankee Rowe	PWR	06/2002-06/2003	NAC-MPC/Yankee-MPC canister	NAC-STC (Docket No. 71-9235); Certificate expires 05/31/2024. Foreign use versions fabricated
Zion 1 & 2	PWR	2013-2016	NAC MAGNASTOR/TSC 37 canister	NAC MAGNATRAN (Docket No. 71-9356); Certificate expires 4/30/2024. No units fabricated.

a. Dates represent the dates that the spent nuclear fuel was transferred to the ISFSI.

Table 2-30. Cask Systems Used at Group A Sites Shutdown Post 2000

Reactor [Unit]	Type	ISFSI Load Dates[a]	Storage System/Canisters	Transport Cask Status
Crystal River 3	PWR	2017-2018	TransNuclear, Standardized NUHOMS 32PTH1 storage canister, in a Horizontal Concrete Overpack	TN MP197HB (Docket No. 71-9302) Certificate expires 8/31/2022. One unit started fabrication which has resumed.
Fort Calhoun	PWR	2006-2019	TransNuclear, Standardized NUHOMS 32PT-S100 storage canister, in a Horizontal Concrete Overpack	TN MP197 HB (Docket No. 71-9302); Certificate expires 8/31/2022.
Kewaunee	PWR	2009-2017	TransNuclear, Standardized NUHOMS 32PT-S100 storage canister, in a Horizontal Concrete Overpack Kewaunee also loaded the NAC MAGNASTOR 37 PWR assembly canister	TN MP197HB (Docket No. 71-9302); Certificate expires 8/31/2022. NAC MAGNATRAN (Docket 71-9356) Certificate expires 4/30/2024. . None fabricated
Oyster Creek	BWR	2002-??	TransNuclear, Standardized NUHOMS 61BT and 61BTH canisters	NUHOMS MP187 (Docket No. 71-9255); Certificate expires 11/30/2023. One cask fabricated. No impact limiters.
Pilgrim	BWR	2015-?	HI-STORM 100 Vertical Concrete Storage Cask containing MPC-68 Canisters	HI-STAR 100 (Docket No. 71-9261) Certificate expires 4/30/2024. No impact limiters
San Onofre	PWR	2003-2020	TransNuclear, Advanced NUHOMS 24PT1 and 24 PT4 storage canister, in a Horizontal Concrete Overpack SONGS is currently loading the Holtec UMAX MPC-37 canister	NUHOMS MP187 (Docket No. 71-9255); Certificate expires 11/30/2023. TN MP197HB (Docket No. 71-9302); Certificate expires 8/31/2022. HI-STAR 190 (Docket No. 71-9373), Certificate expires 8/31/2022. None fabricated.
Vermont Yankee	BWR	2008-2018	HI-STORM 100 Vertical Concrete Storage Cask containing MPC-68 and MPC-68M DSC canisters	HI-STAR 100 (Docket No. 71-9261) Certificate expires 4/30/2024.
Duane Arnold	BWR	2003-	TransNuclear, Advanced NUHOMS 61BT and 61BTH storage canister, in a Horizontal Concrete Overpack	NUHOMS MP187 (Docket No. 71-9255); Certificate expires 11/30/2023. One cask fabricated. No impact limiters.
Three Mile Island	PWR	future	NAC MAGNASTOR/TSC-37	NAC MAGNATRAN

a. Dates represent the dates that the spent nuclear fuel was transferred to the ISFSI.

Table 2-31. Cask Systems Used at Shutdown Reactors at Group B Sites

Reactor [Unit]	Type	ISFSI Load Dates[a]	Storage System/Canisters	Transport Cask Status
Dresden 1	BWR	2000-ongoing	HI-STORM Vertical Concrete Storage Cask containing MPC-68 canisters. Four HI-STAR 100 casks are used to store some SNF from Dresden 1.	HI-STAR 100 (Docket No. 71-9261) Certificate expires 4/30/2024. No impact limiters fabricated
Indian Point 1 and 2	PWR	2008- ongoing	HI-STORM Vertical Concrete Storage Cask containing MPC-32 canisters	HI-STAR 100 (Docket No. 71-9261) Certificate expires 4/30/2024. No impact limiters fabricated
Millstone 1	BWR	N/A	All BWR SNF at the Millstone is currently in pool storage.	N/A

a. Dates represent the dates that the spent nuclear fuel was transferred to the ISFSI.

2.4 Spent Nuclear Fuel Characteristics

To date SNF has been discharged with burnup ranging from less than 20 gigawatt-days per metric ton (GWd/MT) and projected to approach 60 GWd/MT. Tables 2-32 through 2-35 and Figures 2-23 to 2-26 present the radionuclide decay heat for the 40 and 60 GWd/MT burnup PWR and 30 and 50 GWd/MT BWR as representative SNF. The figures and tables provide the total decay heat and decay heat by isotopic groups with similar isotopic parameters. Discharged SNF compositions (in g/MT) for representative SNF are available in Appendix C of the Used Fuel Disposition Campaign (UFDC) Inventory report [Carter, 2013].

Table 2-32. PWR 40 GWd/MT Spent Nuclear Fuel Decay Heat

Elements	Decay Heat (Watts/MT)							
	Time (years)							
	1	10	30	50	70	100	300	500
Gases H, C, Xe, Kr, I	0	0	0	0	0	0	0	0
Cs/Sr/Ba/Rb/Y	2,765	1,054	566	354	222	110	1	0
Noble Metals Ag, Pd, Ru, Rh	2,752	11	0	0	0	0	0	0
Lanthanides La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Ho, Tm	3,593	64	10	2	0	0	0	0
Actinides Ac, Th, Pa, U	0	0	0	0	0	0	0	0
Transuranic Np, Pu, Am, Cm, Bk, Cf, Es	819	348	332	309	287	258	159	116
Others	515	15	2	1	0	0	0	0
Totals	**10,444**	**1,492**	**910**	**666**	**509**	**368**	**160**	**116**

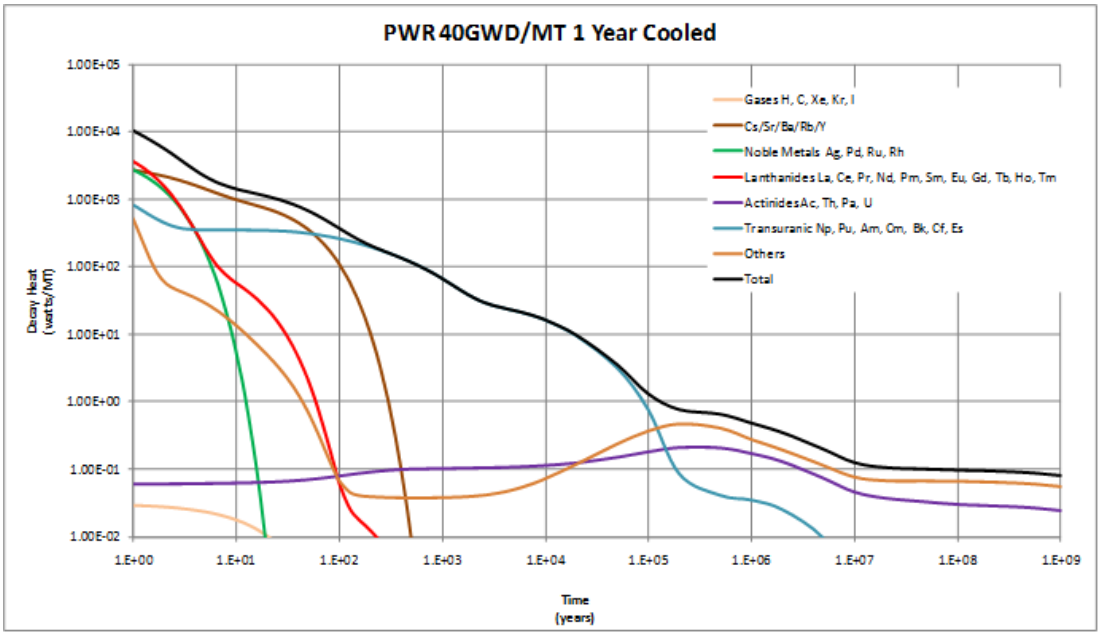


Figure 2-23. PWR 40 GWd/MT Spent Nuclear Fuel Decay Heat.

Table 2-33. PWR 60 GWd/MT Spent Nuclear Fuel Decay Heat

Elements	Decay Heat (Watts/MT)							
	Time (years)							
	1	10	30	50	70	100	300	500
Gases H, C, Xe, Kr, I	0	0	0	0	0	0	0	0
Cs/Sr/Ba/Rb/Y	4,608	1,576	824	516	323	160	1	0
Noble Metals Ag, Pd, Ru, Rh	3,447	14	0	0	0	0	0	0
Lanthanides La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Ho, Tm	3,843	109	17	3	1	0	0	0
Actinides Ac, Th, Pa, U	0	0	0	0	0	0	0	0
Transuranic Np, Pu, Am, Cm, Bk, Cf, Es	1,515	785	613	516	449	381	199	139
Others	522	21	3	1	0	0	0	0
Totals	**13,936**	**2,505**	**1,458**	**1,036**	**773**	**541**	**201**	**139**

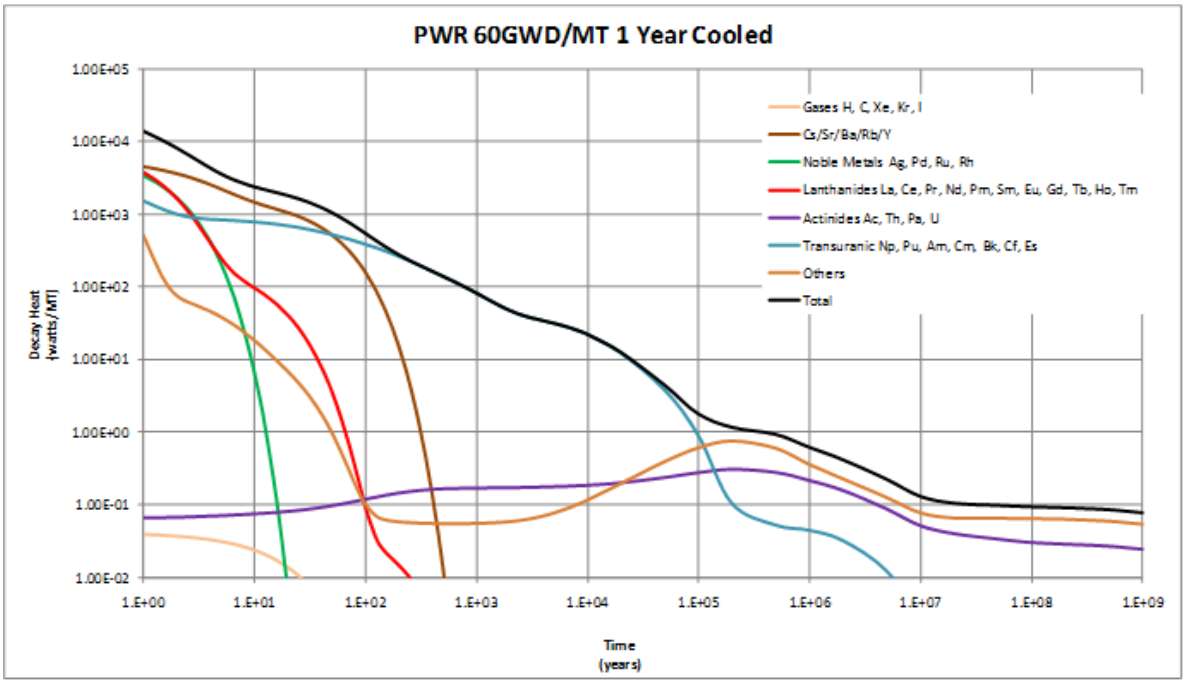


Figure 2-24. PWR 60 GWd/MT Spent Nuclear Fuel Decay Heat.

Table 2-34. BWR 30 GWd/MT Spent Nuclear Fuel Decay Heat

Elements	Decay Heat (Watts/MT)							
	Time (years)							
	1	10	30	50	70	100	300	500
Gases H, C, Xe, Kr, I	0	0	0	0	0	0	0	0
Cs/Sr/Ba/Rb/Y	1,895	778	425	266	166	82	1	0
Noble Metals Ag, Pd, Ru, Rh	2,042	8	0	0	0	0	0	0
Lanthanides La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Ho, Tm	2,675	43	6	1	0	0	0	0
Actinides Ac, Th, Pa, U	0	0	0	0	0	0	0	0
Transuranic Np, Pu, Am, Cm, Bk, Cf, Es	588	225	234	225	213	196	127	94
Others	403	12	2	0	0	0	0	0
Totals	**7,603**	**1,067**	**667**	**493**	**380**	**278**	**128**	**94**

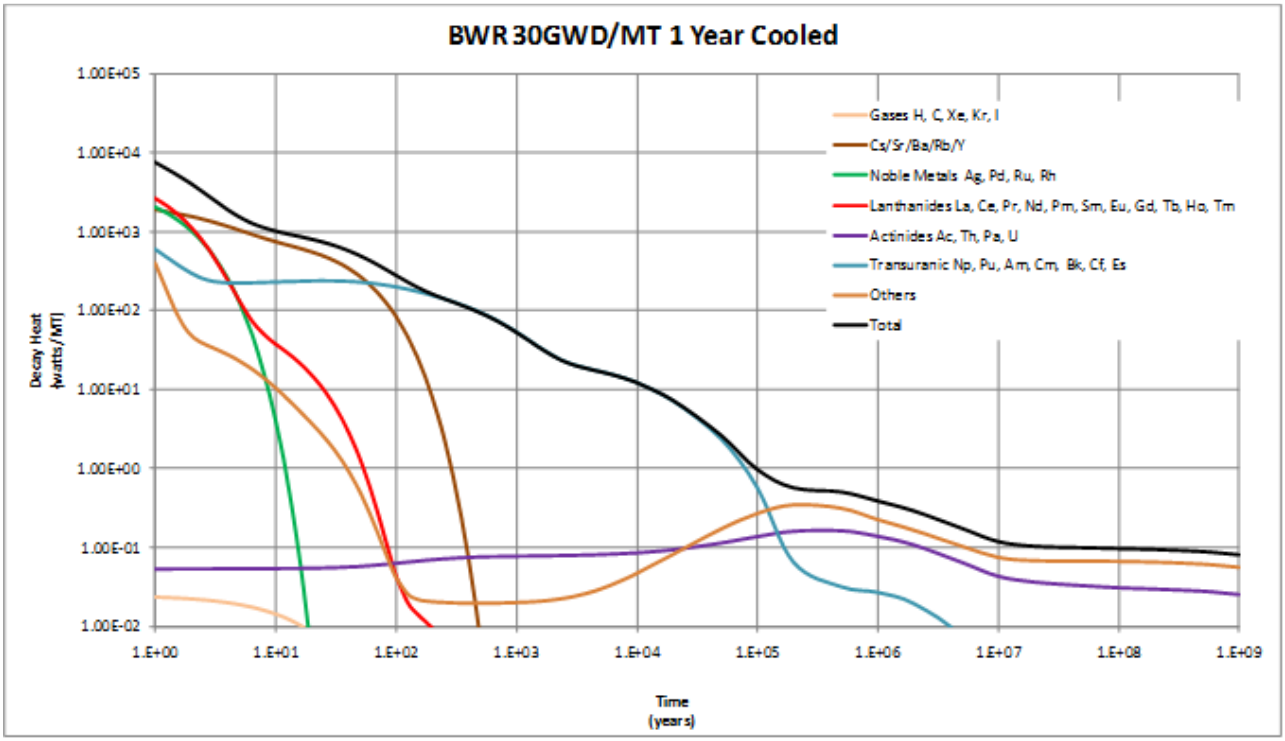


Figure 2-25. BWR 30 GWd/MT Spent Nuclear Fuel Decay Heat.

Table 2-35. BWR 50 GWd/MT Spent Nuclear Fuel Decay Heat

Elements	Decay Heat (Watts/MT)							
	Time (years)							
	1	10	30	50	70	100	300	500
Gases H, C, Xe, Kr, I	0	0	0	0	0	0	0	0
Cs/Sr/Ba/Rb/Y	3,558	1,257	662	414	259	128	1	0
Noble Metals Ag, Pd, Ru, Rh	2,669	11	0	0	0	0	0	0
Lanthanides La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Ho, Tm	2,734	92	14	3	1	0	0	0
Actinides Ac, Th, Pa, U	0	0	0	0	0	0	0	0
Transuranic Np, Pu, Am, Cm, Bk, Cf, Es	1,627	760	591	496	433	369	199	139
Others	420	17	2	1	0	0	0	0
Totals	**11,008**	**2,137**	**1,271**	**914**	**693**	**498**	**200**	**139**

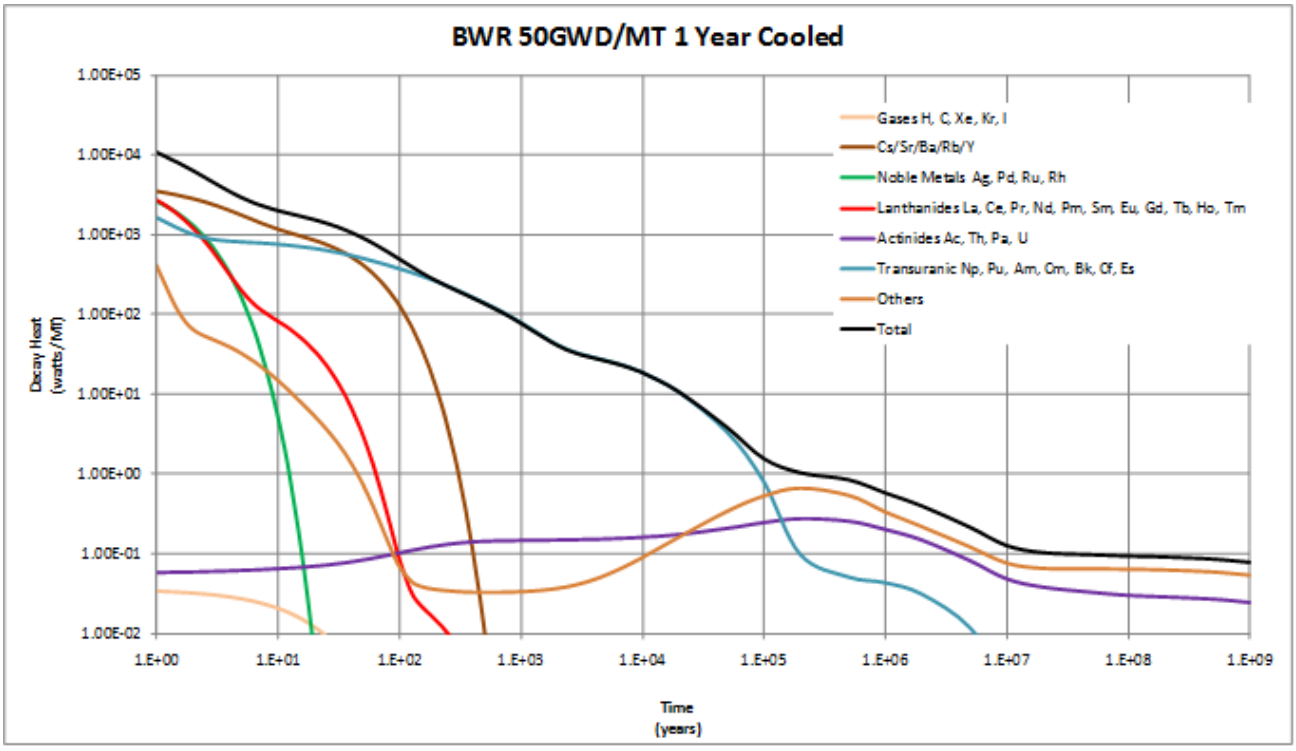


Figure 2-26. BWR 50 GWd/MT Spent Nuclear Fuel Decay Heat.

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3. SNF AT DOE LOCATIONS

Since the inception of nuclear reactors, the DOE and its predecessor agencies operated or sponsored a variety of production, research, test, training, and other experimental reactors both domestically and overseas. The Naval Nuclear Propulsion Program (NNPP) has generated SNF from operation of nuclear-powered submarines and surface ships, operation of land-based prototype reactor plants, operation of moored training ship reactor plants, early development of nuclear power reactors, and irradiation test programs.

3.1 DOE Managed SNF

The SNF located at DOE sites can be generally categorized as:

SNF generated in production reactors supported defense programs and other isotope production programs. An example of SNF existing today from production reactors is the N Reactor SNF stored at Hanford. This is the largest quantity (over 2,100 MTHM) by mass and is included in Section 3.1.1.

DOE sponsored nuclear research activities in the U.S. and overseas. There are four main DOE research reactors; the Advanced Test Reactor (ATR) and the Transient Reactor Test (TREAT) Facility at Idaho National Laboratory (INL), the Annular Core Research Reactor (SNL) and the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory (ORNL). In addition to these there is also the Advanced Test Reactor Critical Facility (a low-power version of the higher-powered ATR core) and the Neutron Radiography (NRAD) Reactor (a TRIGA-type reactor), both at INL. Spent nuclear fuel from ATR is stored in the ATR canal prior to transfer to wet storage at INL's CPP-603 facility, while spent nuclear fuel from HFIR is stored in storage racks within the HFIR pool outside the core zone awaiting shipment to Savannah River Site. Additional information regarding DOE-Research Reactors can be found in Appendices F and H, the listing by state and congressional district and the state-by-state maps, respectively. The inventory is included in Section 3.1.1.

There are numerous university and other government agency research reactor sites within the United States. Permanently discharged SNF from research reactors is stored primarily at the INL and SRS and included in Section 3.1.1. (See Section 4 for more information on the university and other government agency reactors.)

DOE has some early demonstration power reactor SNF remaining from Atomic Energy Commission activities. This inventory is also included in Section 3.1.1

DOE has some NPR SNF resulting from the R&D activities supporting the nuclear power reactors and geologic repository development activities. This inventory is discussed in Section 3.1.2.

SNF resulting from The Nuclear Naval Propulsion Program is included in Section 3.2

3.1.1 SNF Inventory

The source of current inventory data for this study is the Spent Fuel Database (SFD) maintained by the National Spent Nuclear Fuel Program at the INL [NSNFP, 2020]. The current total inventory of SNF is approximately 2,273 MTHM (12/31/2020). DOE continues to operate several research reactors and will be receiving SNF from universities and the foreign research reactor return program. Projected material amounts (out to 2035) are relatively small (about 14 MTHM) and there is some uncertainty as to the total amount that will be generated or received. This quantity includes prior receipts of research reactor SNF from all sources, including SNF remaining from very early power demonstration reactors (approximately 105 MT) such as Shippingport and Peach Bottom Unit 1. This quantity does not include any Naval spent nuclear fuel (see section 3.2) nor the 174 MTHM of spent nuclear fuel of NPR origin (See Section 3.1.2) used in various Research and development studies.

SNF comes from a wide range of reactor types, such as light- and heavy-water-moderated reactors, graphite-moderated reactors, and breeder reactors, with various cladding materials and enrichments, varying from depleted uranium to over 93% enriched ^{235}U. Many of these reactors, now decommissioned, had unique design features, such as core configuration, fuel element and assembly geometry, moderator and coolant materials, operational characteristics, and neutron spatial and spectral properties.

As described below, there is a large diversity of reactor and fuel designs. In addition, there is a relatively large number (over 215,000) of fuel pieces or assemblies, which range from many pieces for some reactors (N Reactor) to a few individual pieces for other unique reactors (Chicago Pile-5 converter cylinders).

There are several hundred distinct types of DOE SNF. This SNF inventory was reduced to 34 groups based on fuel matrix, cladding, cladding condition, and enrichment. These parameters were selected because of their potential relevance to supporting system-level evaluations.

A discussion of each of the 34 groupings is presented in Appendix D of UFDC Inventory [Carter, 2013]. The discussions of each of the 34 groups provide a description of the SNF group and an example of SNF that makes up the group. When appropriate, a more detailed description of a SNF with the largest percentage of MTHM within each group is provided. This discussion is not intended to address each SNF in the group.

Appendix D Table D-1 of UFDC Inventory [Carter, 2013] describes the typical ranges of the nominal properties for SNF in the 34 groups.

3.1.1.1 *SNF Radionuclide Inventory*

Process knowledge and the best available information regarding fuel fabrication, operations, and storage for DOE SNF are used to develop a conservative source-term estimate. The DOE SNF characterization process relies on pre-calculated results that provide radionuclide inventories for typical SNF at a range of decay times. These results are used as templates that are scaled to estimate radionuclide inventories for other similar SNF.

To estimate an SNF source term, the appropriate template is selected to model the production of activation products and transuranics by matching the reactor moderator and fuel cladding, constituents, and beginning-of-life enrichment. Pre-calculated radionuclide inventories are extracted from the appropriate template at the desired decay period and then scaled to account for differences in fuel mass and specific burnup. Appendix A of "DOE Managed Waste" [Wilson, 2016] lists the projected radionuclide inventory of DOE SNF for the nominal and bounding cases as of 2010. The nominal case is the expected or average inventory. The bounding case represents the highest burnup assembly or accounts for uncertainties if fuel burnup is not known.

From the SFD [NSNFP, 2020], the total estimated nominal radionuclide inventory is 110 million Ci for the year 2030. The estimated bounding radionuclide inventory is 224 million Ci for the year 2030. The nominal case is the expected or average inventory. The bounding case represents the highest burnup assembly or accounts for uncertainties if fuel burnup is not known.

3.1.1.2 *SNF Storage/Canisters*

SNF has been stored throughout the U.S. at numerous facilities. A decision was made in 1995 to consolidate the material at three existing DOE sites; Hanford Site in Washington (2,127 MT), the INL in Idaho (114 MT), and the SRS in South Carolina (27 MT). The vast majority of SNF is currently stored at these three sites. The storage configurations vary for each of the sites and include both dry and wet storage. On a MTHM basis, a large portion (~2,100 MT) of the SNF is contained in about 388 Multi-canister Overpacks (MCO) at the Hanford site. The MCO is a sealed, stainless steel canister which is about 24 inches in diameter and about 14 feet long.

For the remaining SNF, a standard disposal canister design was developed which included canisters of 18- and 24-inch diameters and 10- and 15-foot lengths. Because of uncertainty in disposal and packaging efficiencies, the total number of canisters to be generated ranged from about 50% to 160% of a point estimate of 2,524. Currently, no SNF has been packaged into the standardized disposal canister design.

The radionuclide inventory and resulting decay heat was calculated for the year 2030 based on the estimated radionuclide inventory as described in Section 3.1.2. The decay heat per canister is calculated as the estimated decay heat associated with each SNF record divided by the number of canisters (unrounded) required for the SNF (based on volume). These values are considered adequate for this scoping evaluation.

Table 3-1 provides the distribution of standard canisters based on the 2030 nominal decay heat using the 2,524 nominal total canister count. Table 3-1 provides detail for the DOE SNF. The 2030 data indicate over 60% of the DOE SNF canisters will be generating decay heat of less than 100 watts. About 95% of the DOE SNF canisters will be generating decay heat less than 300 watts. Nearly all the DOE SNF canisters (>99%) will be generating less than 1 kW. Since the methodology used to calculate the radionuclide inventory is very conservative, some SNF have radionuclide amounts based on bounding assumptions resulting in extreme decay heat values.

Table 3-1. Spent Nuclear Fuel Canister Decay Heat in 2030 [NSNFP, 2020]

	DOE SNF	
Decay heat per canister (watts)	**Number of canisters[f]**	**Cumulative %**
<50	1,134	44.9%
50 - 100	492	64.4%
100 - 220	675	91.1%
220 - 300	105	95.2%
300 - 500	96	99.0%
500 - 1000	15	99.6%
1000 - 1500	3	99.7%
1500 - 2000	1	99.7%
>2000	7	100.0%
Total	**2,524**	

[f] The fractional canister counts from the application of a loading algorithm in the SFD database have been rounded up to the whole canister. These provide a relative comparison for the quantities in each decay heat range and do not represent a future "as loaded" condition. These do not sum to the "Total" provided by the SFD database. The Cumulative percentages use the algorithm values.

3.1.2 SNF from NPR Research and Development Activities

The Spent Fuel Database (SFD) maintained by the National Spent Nuclear Fuel Program at the INL [NSNFP, 2020] tracks spent nuclear fuel of NPR origin which is being managed by DOE. For this study, NPR SNF is identified as having been discharged from the reactors listed in Table 2-1 as well as Three Mile Island Unit 2 debris, and Ft. St. Vrain.

There is 173.6 MTHM of NPR SNF, as defined in this report, that is currently managed by DOE according to the SFD. The contributors to this total include 81.6 MTHM of Three Mile Island Unit 2 core debris, 23.6 MTHM for Ft St. Vrain SNF (both in Colorado and Idaho), and 68.4 MTHM from other NPR sites (e.g., Surry, Ginna, and Robinson) used in various research and development programs. This 68.4 MTU is less than the 73 MTU reported in GC-859 to have been transferred to DOE. This is due to DOE material disposition programs, vitrification research programs, and post irradiation examination.

The intact portion of this SNF from LWRs could be transported and disposed in six waste packages sized to accommodate 21 PWR assemblies or 44 BWR assemblies. The non-intact portion of this SNF could be loaded into DOE standard canisters (see Section 3.1.2 for a description of the standard canister) before shipment and disposal. The non-intact portion is projected to generate 824 DOE standard canisters. Table 3-2 provides a breakdown of the decay heat characteristics for all 830 canisters containing SNF of NPR origin.

Table 3-2. Canister Decay Heat Characteristics of NPR Origin SNF in DOE Possession

Decay heat per canister (watts)	2030		
	Number of DOE Standard Canisters[g]	Number of Intact Assembly Canisters	Cumulative %
<50	791	0	95.2%
50 - 100	2	0	95.4%
100 - 220	2	0	95.6%
220 - 300	1	0	95.7%
300 - 500	1	0	95.7%
500 - 1000	27	0	99.0%
1000 - 1500	2	0	99.1%
1500 - 2000	0	0	99.1%
>2000	2	6	100.0%
Totals	**830**		

[g] The fractional canister counts from the application of a loading algorithm in the SFD database have been rounded up to the next whole canister. These provide a relative comparison for the quantities in each decay heat range and do not represent a future "as loaded" condition. These do not sum to the "Total" provided by the SFD database. Cumulative % is based on the algorithm values.

3.2 Naval SNF

The NNPP has generated SNF from operation of nuclear-powered submarines and surface ships, operation of land-based prototype reactor plants, operation of moored training ship reactor plants, early development of nuclear power, and irradiation test programs. The source of naval SNF information for this report is the unclassified portion of the Yucca Mountain Repository License Application [DOE, 2008] and an evaluation report on options for permanent geologic disposal of spent nuclear fuel and HLW [SNL, 2014]. Since most details regarding naval SNF are classified, only limited information is presented herein.[h]

3.2.1 Naval SNF Inventory

Naval SNF consists of solid metal and metallic components that are nonflammable, highly corrosion-resistant, and neither pyrophoric, explosive, combustible, chemically reactive, nor subject to gas generation by chemical reaction or off-gassing. Approximately 38 MTHM of Naval SNF currently exists with a projected inventory of less than 65 MTHM in 2035.

New naval nuclear fuel is highly enriched uranium. As a result of the high uranium enrichment, very small amounts of transuranics (TRU) are generated by end of life when compared to NPR SNF.

3.2.2 Naval SNF Radionuclide Inventory

Each naval SNF canister is loaded such that thermal, shielding, criticality, and other characteristics of the received waste will be within the proposed repository waste acceptance requirement limits. As a result, a radionuclide inventory for a representative naval SNF canister, five years after reactor shutdown, was developed for use in the repository source term analyses (UFD Inventory Appendix E, Table E-1 [Carter, 2013]). Different packaging designs may be needed dependent upon the future disposal options.

3.2.3 Naval SNF Storage/Canisters

SNF from the NNPP is temporarily stored at the INL. To accommodate different naval fuel assembly designs, naval SNF is loaded in either a naval short SNF canister or a naval long SNF canister. Both were sized to fit within the proposed design for the Yucca Mountain repository waste package.

The outer diameter of the naval SNF canister is 66 in. nominal (66.5 inches maximum). The maximum external dimensions ensure naval SNF canisters fit into the waste packages. The naval short SNF canister is 185.5 inches (nominal) in length (187 inches maximum), and the naval long SNF canister is 210.5 inches (nominal) in length (212 inches maximum). Except for length, the geometry of the naval SNF canisters are identical.

Approximately 400 naval SNF canisters (310 long and 90 short) are currently planned to be packaged and temporarily stored pending shipment. The average thermal load is 4,250 watts/container. The maximum heat load of all containers will be under the 11,800 watts/container limit established for Yucca Mountain. The NNPP is responsible for preparing and loading naval SNF canisters and began canister loading operations in 2002. As of December 31, 2020, 192 naval SNF canisters have been loaded and are being temporarily stored at INL. Table 3-3 provides the distribution of Naval SNF canisters based on nominal decay heat. [SNL, 2014]

[h] Before using the information in this section for studies involving naval SNF, contact the NNPP Program Manager, Naval Spent Nuclear Fuel at (202) 781-5903.

Table 3-3. Naval SNF Canister Decay Heat

Decay heat per canister (watts)	Number of canisters	Cumulative %
500 to 1000	13	3.3%
1000 to 2500	36	12.3%
2500 to 5000	94	35.8%
>5000	257	100.0%
Total	**400**	

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4. SNF AT OTHER SITES

Spent Nuclear Fuel at other sites includes: University Research Reactors, other Government Agency reactors, and Commercial Research and Development Centers. The SNF quantities are derived from the "United States of America National Report for the Seventh Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management" that was issued in October 2020 which in turn references the Spend Fuel Database version 7.06. The total SNF is approximately 1.34MT.

4.1 University Research Reactors

University research reactors operate at power levels that range from around 0.005 kW (AGN-201) up to 20 MW (NIST). Permanently discharged SNF from these reactors is generally sent to either SRS or INL, and the SNF is managed by DOE and included in the inventory discussed in Section 3.1. There are twenty-one university research reactors in operation at twenty sites (2 reactors collocated at Texas A&M University). Most are used for research and for educational purposes. Table 4-1 provides a listing of the university reactors and the quantities of spent nuclear fuel at those locations. The quantities reported include the in-core amounts and SNF which has not reached the end of its useful life. Permanently discharged SNF is returned to DOE and included in the inventory in Section 3.1.1. Additional information regarding research reactors at universities is included in the listing by state and congressional district (Appendix F) and the state-by-state maps (Appendix G).

Table 4-1. University Research Reactors

State	Installation	Inventory (kg)
California	University of California (Irvine)	20.33
	University of California (Davis)	80.33
Florida	University of Florida (Gainesville)	19.30
Indiana	Purdue University (West Lafayette)	12.03
Kansas	Kansas State University (Manhattan)	21.44
Maryland	University of Maryland (College Park)	19.84
Massachusetts	University of Massachussets-Lowell	10.64
	Massachusetts Institute of Technology (Cambridge)	19.85
Missouri	University of Missouri (Columbia)	36.19
	University of Missouri (Rolla)	25.52
North Carolina	North Carolina State University (Raleigh)	484.05
Ohio	Ohio State University (Columbus)	26.15
Oregon	Oregon State University (Corvallis)	75.63
	Reed College (Portland)	18.94
Pennsylvania	Pennsylvania State University (University Park)	37.94
Texas	Texas A&M University (College Station)	68.76
	University of Texas (Austin)	42.83
Utah	University of Utah (Salt Lake City)	25.77
Washington	Washington State University (Pullman)	57.53
Wisconsin	University of Wisconsin (Madison)	58.28
Total		**1,158.35**

4.2 Other Government Agency Research Reactors

Table 4-2 lists research reactors operated by other government organizations. Permanently discharged SNF from these reactors is generally sent to either SRS or INL, and the SNF is managed by DOE and included in the inventory discussed in Section 3.1.

Table 4-2. Other Government Agency Research Reactors SNF

State	Installation	Inventory (kg)*
Colorado	U.S. Geological Survey (Denver)	40
Maryland	National Institute of Standards and Technology (Gaithersburg)	10
	Armed Forces Radiobiology Research Institute (Bethesda)	20
Rhode Island	Rhode Island Atomic Energy Commission (Narragansett)	30
Total		**100**

* rounded to the nearest 10 kg

4.3 Commercial Research and Development Centers

Table 4-3 lists commercial research and development centers. Three sites have reactors while the BWX Technologies site in Virginia is a fuel cycle research center conducting SNF destructive examinations among other activities.

Table 4-3. Commercial Research and Development Centers SNF

State	Installation	Inventory (kg)
California	Aerotest Research Reactor (San Ramon)	17.50
	General Electric (Pleasanton)	3.98
Michigan	Dow Chemical, Research Reactor (Midland)	14.81
Virginia	BWX Technology, Fuel cycle R&D Center (Lynchburg)	43.89
Total		**80.18**

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5. REPROCESSING WASTE

Aqueous reprocessing of SNF has occurred at the Hanford Site, the INL, and the SRS. The INL is using electro-chemical processing to treat up to 60 MTHM of sodium bonded SNF. The Defense Waste Processing Facility at SRS is converting the reprocessing waste into borosilicate glass and a reprocessing waste treatment facility is under construction at the Hanford site.

In addition, some NPR SNF was reprocessed at a private company, Nuclear Fuel Services, located at the Western New York Service Center which is owned by the New York State Energy Research and Development Authority. The reprocessing waste has been treated by conversion into borosilicate glass and is stored on the site. (Section 5.2)

5.1 Reprocessing Waste at DOE Sites

High-level radioactive waste[i] is the highly radioactive material resulting from the reprocessing of SNF, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation. Aqueous reprocessing waste is in a liquid form and historically has been stored in underground metal storage tanks. Long term storage of reprocessing waste requires stabilization of the wastes into a form that will not react, nor degrade, for an extended period of time. Two treatment methods used for stabilization of the waste are vitrification or calcination. Vitrification is the transition of the reprocessing waste into a glass by mixing with a combination of silica sand and other constituents or glass forming chemicals that are melted together and poured into stainless steel canisters. Glass canisters have a nominal diameter of 2 feet and have heights of 10 or 15 feet. Calcination of reprocessing waste is accomplished by injecting the waste with calcining additives into a fluidized bed to evaporate the water and decompose the remaining constituents into a granular solid material.

In addition to aqueous reprocessing, the INL is using electro-chemical processing to treat up to 60 MTHM of sodium bonded SNF. The process converts the bond sodium into sodium chloride and separates the SNF into a uranium product and reprocessing waste. The reprocessing waste is produced in two forms, ceramic and metal. The ceramic waste form primarily contains the salt electrolyte with active metal fission products and the metal waste is primarily the cladding hulls and undissolved noble metals. The process has been demonstrated and used to treat about 4 MTHM of sodium bonded SNF to date.

5.1.1 Current Reprocessing Waste Inventory

The sources of inventory data for this report includes information collected by the Department's OCRWM for the Yucca Mountain License Application [DOE, 2008] and recent site treatment plans. [DOE, 2017; Chew, 2019]

The INL reprocessed SNF from naval propulsion reactors, test reactors, and research reactors to recover uranium and generated approximately 30,000 m^3 of liquid reprocessing waste. Between 1960 and 1997, the INL converted their liquid reprocessing waste into about 4,400 m^3 of a solid waste form called calcine

[i] This report does not necessarily reflect final classifications for the material being discussed; for example, material referred to as "HLW" or "SNF" may be managed as HLW and SNF, respectively, without having been actually classified as such for disposal. In this report "reprocessing waste" primarily refers to the waste stream containing most of the fission products which is typically extracted during the first cycle of nuclear fuel reprocessing and, for aqueous reprocessing, often proposed for vitrification.

(a granular solid with the consistency of powder laundry soap). These solids are stored retrievably on-site in stainless steel bins (like grain silos but smaller) within concrete vaults.

The SRS has reprocessed defense reactor SNF and nuclear targets to recover valuable isotopes since 1954 producing more than 600,000 m^3 of liquid reprocessing waste. Through evaporation and vitrification of the waste, SRS has reduced this inventory to the current level of about 133,000 m^3 of liquid reprocessing waste. [Chew, 2016] SRS began vitrifying reprocessing waste in 1996 and through December 31, 2020 has produced 4,226 vitrified waste canisters (2 feet × 10 feet).

The Hanford Site reprocessed defense reactor SNF since the 1940s and has generated about 220,000 m^3 of liquid reprocessing waste to recover the plutonium, uranium, and other elements for defense and other federal programs. Construction of a vitrification facility is currently underway. Table 5-1 summarizes the current reprocessing inventory.

Table 5-1. Current Reprocessing Waste Inventory

Site	Vitrified Waste Canisters[1]	Liquid Reprocessing Waste[2] (m^3)	Dry Reprocessing Waste[3] (m^3)
Hanford	N/A	220,000	N/A
INL	N/A	N/A	4,400
SRS	4,226[4]	133,000	N/A

1. Vitrified Reprocessing Waste in stainless steel canisters.
2. Reprocessing Waste stored in tanks.
3. Calcined reprocessing waste stored in bins.
4. Produced through December 31, 2020. Source: "DWPF Operations Summary Report" SRR-RP-2020-00002-0250, December 30, 2020 05:00 hrs to December 31, 2020 05:00.

The Hanford Site encapsulated Cs and Sr separated from the liquid waste between 1974 and 1985. Some of these capsules were leased to companies as radiation sources. After one of the capsules developed a microscopic leak, the capsules were recalled. Hanford is storing 1,335 Cs capsules and 601 Sr capsules, which contained approximately 109 million curies at the time of production. Table 5-2 provides the capsule inventory broken down by decay heat load. Decay heat continues to decrease and as of 1/1/2020 the total radioactivity has been reduced to approximately 42M Ci with decay continuing to approximately 24 million curies by January 2043 [Covey, 2002].

The Hanford Tank Closure and Waste Management FEIS evaluated selected disposition pathways for the capsule contents. One alternative evaluated was conversion to glass. In this scenario, the capsule contents have potential to generate an additional 340 vitrified reprocessing waste canisters.

No decision has been made on the disposition of the Cs/Sr capsules. At present, DOE is working to construct a dry storage facility to replace wet storage in Waste Encapsulation and Storage Facility (WESF). After transferring the 1,936 capsules to dry storage, they would be safely stored until a future decision on disposition is made.

Table 5-2. Hanford Site Encapsulated Cs and Sr Inventory Distribution as of 1/1/2020

	Cs Capsules		Sr Capsules		Total Capsules	
Decay heat per canister (watts)	**Number of canisters**	**Cumulative %**	**Number of canisters**	**Cumulative %**	**Number of canisters**	**Cumulative %**
<50	3	0.2%	64	10.6%	67	3.5%
50 – 100	232	17.6%	125	31.4%	357	21.9%
100 – 200	1,100	100.0%	298	81.0%	1,398	94.1%
200 - 300	-	100.0%	105	98.5%	105	99.5%
300 - 500	-	100.0%	9	100.0%	9	100.0%
500 - 1000	-	100.0%	-	100.0%	-	100.0%
1000 - 1500	-	100.0%	-	100.0%	-	100.0%
1500 - 2000	-	100.0%	-	100.0%	-	100.0%
>2000	-	100.0%	-	100.0%	-	100.0%
Total Canisters	**1,335**		**601**		**1,936**	
Total Decay Heat (watts)	**144,421**		**85,508**		**229,930**	

5.1.2 Projected Reprocessing Waste Inventory

SRS currently has the only operating reprocessing facility in the United States, H Canyon. It is estimated that an additional 12,000 m^3 of liquid reprocessing waste may be generated with continued canyon operations [Chew, 2019] (approximately 2026, including H-Canyon shutdown flows).

The projected number of vitrified reprocessing waste canisters to be generated at each site will be dependent on actual loading and final waste form. Because of this uncertainty, the actual number of reprocessing waste canisters produced may vary significantly from what is anticipated today.

SRS began conversion of the liquid defense waste into borosilicate glass in 1996 and is the only DOE site with vitrified waste in a packaged configuration. A total of 4,226 canisters have been produced through December 31, 2020. Therefore, the SRS inventory can be described as those canisters in the current inventory and those projected from future operations. Decay heat of the current inventory is based on radiological inventories contained in the production records for those canisters. The decay heat of future canisters is estimated based on the radionuclide composition of the reprocessing waste inventory remaining in the liquid waste storage tanks. The radionuclide and resulting decay heat is calculated based on the year the canister is/will be produced. The total Savannah River canister count is based on information supporting Savannah River Liquid Waste Disposition Plan revision 21 which assumes a Salt Waste Processing Facility start-up date of FY-20.

Table 5-3 provides the projected canister distribution of SRS canisters based on the nominal decay heat at the time of production. The data indicate: about 33% of the Savannah River canisters will be generating less than 50 watts; 96% of the Savannah River canisters will be generating less than 300 watts; all the SRS canisters will be generating less than 500 watts.

Table 5-3. Savannah River Canister Decay Heat Distribution (projected)

Savannah River		
Decay heat per canister (watts)	**Number of canisters**	**Cumulative %**
<50	2,625	32.3%
50 – 100	984	44.4%
100 – 200	3,668	89.6%
200 – 300	537	96.2%
300 – 500	307	100.0%
500 – 1000	0	100.0%
1000 – 1500	0	100.0%
1500 – 2000	0	100.0%
>2000	0	100.0%
Totals	**8,121**	
Total Decay Heat (watts)	**848,622**	

The Hanford Waste Treatment Project (WTP) is currently under construction and therefore the Hanford borosilicate glass canisters are based on a reference baseline inventory for their future production taken from *River Protection Project System Plan*, Revision 8 [DOE, 2017] as 7,800 canisters of glass and 8,400 TRU waste drums. System Plan Revision 8 includes 11 different scenarios with glass canister production ranging from 7,200 (Scenario 4) to 63,600 (Scenario 3). Scenario 2 assumes DOE does not elect to pursue Contact-Handled Transuranic (CH-TRU) waste treatment which results in an estimated 11,400 canisters.

Scenario 2 is similar with 11,079 canisters estimated by the January 2011 Waste Treatment Plant document titled "2010 Tank Utilization Assessment". This tank utilization assessment includes individual canister specific decay heat values which are summarized in Table 3-6 indicating 85% of the Hanford canisters will be generating less than 50 watts; and 100% of the Hanford canisters will be generating less than 300 watts. Since the Hanford system plan baseline (Scenario 1[j]) results in about 3,279 fewer canisters (29.6%) and the CH-TRU waste drums will not contain significant decay heat products, the decay heat values resulting from the current Hanford baseline will result in approximately 30% increase in each decay heat value group in Table 5-4.

At INL several options were considered for ultimate disposal of the calcine. Alternatives included direct disposal, vitrification, or hot isostatic pressing (HIP) to compress the calcine into a volume-reduced monolithic waste form. A Record of Decision issued December 2009 determined that DOE will use the HIP technology to treat the calcine.

[j] Specific canister decay heat projections are not available for the current Hanford reference baseline scenario

Decay heat of DOE calcined waste currently stored at the Idaho site is taken from the October 2005 Idaho Cleanup Project document titled "Decay Heat and Radiation from Direct Disposed Calcine", EDF-6258 revision 0. EDF-6258 provides this data for direct disposal of the calcine waste. The current Record of Decision for disposal of the calcine is for it to be treated using HIP, which will result in an approximate 50% increase in the volume of calcine material (due to additives) followed by about 30% decrease in the volume as a result of the HIP process. The size of the final HIP container and final packaged canister remains under investigation. The current estimate is 3700 canisters.

Table 5-4 provides the projected distribution of DOE calcine canisters based on the nominal decay heat in the year 2017. The data indicates that 100% of calcine canisters will be less than 50 watts.

Table 5-4. Hanford and Idaho Waste Inventory (projected)

	Hanford Borosilicate Glass[a]		Idaho Calcine[b]	
Decay heat per canister (watts)	**Number of canisters**	**Cumulative %**	**Number of canisters**	**Cumulative %**
<50	9,291	83.9%	3,700	100.0%
50 - 100	1,237	95.0%		
100 - 200	523	99.7%		
200 - 300	28	100.0%		
300 - 500	0	100.0%		
500 - 1000	0	100.0%		
1000 - 1500	0	100.0%		
1500 - 2000	0	100.0%		
>2000	0	100.0%		
Totals	**11,079**		**3,700**	
Total Decay Heat (watts)	**304,904**		**92,674**	

[a] Projected based on future waste vitrification operations.
[b] Projected based on future waste treatment which may change.

Table 5-5 shows the estimated number of vitrified reprocessing waste canisters to be produced. The current best estimate and a potential range are provided. [Marcinowski memo to Kouts, 2008; EIS, 2002; Chew, 2019, DOE-2017] Table 1-1 and Appendix F provides the equivalent MTHM using the "Best Estimate" canisters count and using the historical factor of 0.5 MTHM per canister established in DOE/DP 0020/1 [DOE, 1985].

Table 5-5. Projected Total Number of DOE Vitrified Reprocessing Waste Canisters

	Canisters[1] Best Estimate	Canister Range
Hanford	7,800	7,200-63,600
INL (Calcine)	3,700	1,190 - 11,200
INL (Electro-chemical processing)	102	82-135
SRS	8,121	8,000 - 8,300
Totals	**19,723**	**~16,500 - ~83,200[2]**

1. With the exception of Hanford, all canisters are 2 feet × 10 feet, Hanford canisters are 2 feet × 15 feet

2. Rounded to nearest 100 canisters

5.1.3 Reprocessing Waste Radionuclide Inventory

"DOE Managed Waste" [Wilson, 2016 Appendix B] lists the total reprocessing waste radionuclide inventory for each of the generating sites decayed to 2017. Although there may be some variation in the number of canisters produced for the sites that have not completed waste treatment, the total amount of radionuclide will not change except by radioactive decay. The combined inventory from all three sites is aproximately1.3 million watts.

OCRWM used the "projected maximum" inventory on a per canister basis for the vitrified reprocessing waste curie content supplied by SRS. The use of the "projected maximum" on a per canister basis resulted in a conservative total curie content for SRS that is approximately twice the actual SRS tank farm inventory. The expected curie content of SRS reprocessing waste is presented in DOE Managed Waste [Wilson, 2016 Appendix B].

SRS is also the only DOE site continuing reprocessing, and the DOE-EM program periodically processes excess special isotopes via the reprocessing facility and the vitrification process. The potential for future EM special isotope disposal campaigns has not been assessed in this study.

The total radionuclide inventory for treatment of sodium bonded SNF is shown in UFD Inventory Table F3. [Carter, 2013]

5.1.4 Vitrified Reprocessing Waste Storage

The vitrified reprocessing waste canisters at SRS is stored in below grade concrete vaults, called Glass Waste Storage Buildings (GWSB), containing support frames for vertical storage of 2,262 canisters. SRS currently has two GWSBs. The first GWSB is being modified such that canisters can be stacked two high, doubling the capacity of this building and delaying the need for a third GWSB. As of January 2020, one thousand additional storage positions have been recovered by the double stack modifications.

5.2 Reprocessing Waste at West Valley

A spent nuclear fuel reprocessing plant was constructed and operated by Nuclear Fuel Service. The facility was located at Western New York Service Center which is owned by the New York State Energy Research and Development Authority. The facility operated from 1966 through 1972 and reprocessed approximately 640 metric tons of SNF to recover the plutonium and unused uranium [NFS, 1973]. Of the SNF reprocessed at West Valley, about 260 metric tons were NPR fuel and about 380 metric tons were DOE N Reactor fuel. Included in this amount processed were approximately 30 MTHM of unirradiated fuel for the N Reactor and 3 MTHM of unirradiated fuel for the Pathfinder reactor.

During operations, about 2,500 m^3 of liquid HLW was generated. The liquid HLW was vitrified between 1996 and 2001 producing 278 canisters, including 275 canisters of vitrified HLW, two additional canisters used to evacuate the melter prior to decommissioning, and one non-routine HLW canister (WV-413), that are stored at West Valley [DOE, 1996]. Appendix F provides the equivalent MTHM contained in these canisters based upon the historical factor of 2.3 MTHM per canister established in DOE/DP 0020/1. This factor is conservative for the West Valley canisters, recognizing that a portion of the fuel processed was unirradiated.

Table 5-6. West Valley High-Level Waste Inventory

Site	HLW Canisters[1]	Liquid HLW (m^3)	Dry HLW (m^3)
West Valley	278[2]	N/A	N/A

1. Vitrified HLW in stainless steel canisters.
2. Includes 2 canisters used to evacuate the melter prior to decommissioning in 2002 and 1 non-routine HLW canister (WV-413).

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Appendix A

Nuclear Fuel Characteristics

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Table A-1. Physical characteristics of pressurized water reactor assembly class

Assembly Class	Array Size	Manufacturer Code	Version	Assembly Code	Length (in.)	Width (in.)	Clad Material
B&W 15 × 15	15 × 15	B&W	B&W Mark B	B1515B	165.7	8.54	Zircaloy-4
			B&W Mark B10	B1515B10	165.7	8.54	Zircaloy-4
			B&W Mark B3	B1515B3	165.7	8.54	Zircaloy-4
			B&W Mark B4	B1515B4	165.7	8.54	Zircaloy-4
			B&W Mark B4Z	B1515B4Z	165.7	8.54	Zircaloy-4
			B&W Mark B5	B1515B5	165.7	8.54	Zircaloy-4
			B&W Mark B5Z	B1515B5Z	165.7	8.54	Zircaloy-4
			B&W Mark B6	B1515B6	165.7	8.54	Zircaloy-4
			B&W Mark B7	B1515B7	165.7	8.54	Zircaloy-4
			B&W Mark B8	B1515B8	165.7	8.54	Zircaloy-4
			B&W Mark B9	B1515B9	165.7	8.54	Zircaloy-4
			B&W Mark BGD	B1515BGD	165.7	8.54	Zircaloy-4
			B&W Mark BZ	B1515BZ	165.7	8.54	Zircaloy-4
		WE	WE	B1515W	165.7	8.54	not available
B&W 17 × 17	17 × 17	B&W	B&W Mark C	B1717B	165.7	8.54	Zircaloy-4
CE 14 × 14	14 × 14	ANF	ANF	C1414A	157.0	8.10	Zircaloy-4
		CE	CE	C1414C	157.0	8.10	Zircaloy-4
		WE	WE	C1414W	157.0	8.10	Zircaloy-4
CE 16 × 16	16 × 16	CE	CE	C1616CSD	176.8	8.10	Zircaloy-4
CE System 80	16 × 16	CE	CE System 80	C8016C	178.3	8.10	Zircaloy-4
WE 14 × 14	14 × 14	ANF	ANF	W1414A	159.8	7.76	Zircaloy-4
		ANF	ANF Top Rod	W1414ATR	159.8	7.76	Zircaloy-4
		B&W	B&W	W1414B	159.8	7.76	not available
		WE	WE LOPAR	W1414WL	159.8	7.76	Zircaloy-4
		WE	WE OFA	W1414WO	159.8	7.76	Zircaloy-4
		WE	WE Std	W1414W	159.8	7.76	Zircaloy-4

Table A-1 (continued)

Assembly Class	Array Size	Manufacturer Code	Version	Assembly Code	Length (in.)	Width (in.)	Clad Material
WE 15 × 15	15 × 15	ANF	ANF	W1515A	159.8	8.44	Zircaloy-4
			ANF HT	W1515AHT	159.8	8.44	not available
			ANF Part Length	W1515APL	159.8	8.44	not available
		WE	LOPAR	W1515WL	159.8	8.44	Zircaloy-4
			OFA	W1515WO	159.8	8.44	Zircaloy-4
			WE Std	W1515W	159.8	8.44	Zircaloy
			WE Vantage 5	W1515WV5	159.8	8.44	not available
WE 17 × 17	17 × 17	ANF	ANF	W1717A	159.8	8.44	Zircaloy-4
		B&W	B&W Mark B	W1717B	159.8	8.44	not available
		WE	WE	W1717WRF	159.8	8.44	not available
			WE	W1717WVJ	159.8	8.44	not available
			WE LOPAR	W1717WL	159.8	8.44	Zircaloy-4
			WE OFA	W1717WO	159.8	8.44	Zircaloy-4
			WE Pressurized	W1717WP	159.8	8.44	not available
			WE Vantage	W1717WV	159.8	8.44	not available
			WE Vantage +	W1717WV+	159.8	8.44	ZIRLO
			WE Vantage 5	W1717WV5	159.8	8.44	Zircaloy-4
			WE Vantage 5H	W1717WVH	159.8	8.44	not available
South Texas	17 × 17	WE	WE	WST17W	199.0	8.43	Zircaloy-4
Ft. Calhoun	14 × 14	ANF	ANF	XFC14A	146.0	8.10	not available
		CE	CE	XFC14C	146.0	8.10	Zircaloy-4
		WE	WE	XFC14W	146.0	8.10	not available

Table A-1 (continued)

Assembly Class	Array Size	Manufacturer Code	Version	Assembly Code	Length (in.)	Width (in.)	Clad Material
Haddam Neck	15 × 15	B&W	B&W SS	XHN15B	137.1	8.42	SS-304
			B&W Zir	XHN15BZ	137.1	8.42	Zircaloy
		GA	Gulf SS	XHN15HS	137.1	8.42	SS
			Gulf Zir	XHN15HZ	137.1	8.42	Zircaloy
		NU	NUM SS	XHN15MS	137.1	8.42	SS
			NUM Zir	XHN15MZ	137.1	8.42	Zircaloy
		WE	WE	XHN15W	137.1	8.42	SS-304
			WE Zir	XHN15WZ	137.1	8.42	not available
Indian Point-1	13 × 14	WE	WE	XIP14W	138.8	6.27	SS
Palisades	15 × 15	ANF	ANF	XPA15A	147.5	8.20	Zircaloy-4
		CE	CE	XPA15C	147.5	8.20	Zircaloy-4
St. Lucie-2	16 × 16	CE	CE	XSL16C	158.2	8.10	Zircaloy-4
San Onofre-1	14 × 14	WE	WE	XSO14W	137.1	7.76	SS-304
			WE D	XSO14WD	137.1	7.76	not available
			WE M	XSO14WM	137.1	7.76	not available
Yankee Rowe	15 × 16	ANF	ANF	XYR16A	111.8	7.62	Zircaloy-4
		CE	CE	XYR16C	111.8	7.62	Zircaloy-4
		UNC	UNC	XYR16U	111.8	7.62	not available
	17 × 18	WE	WE	XYR18W	111.8	7.62	SS
NOTE: Some characteristics of more recently discharged SNF (post-2002) have not yet been provided							

Table A-2. Physical characteristics of boiling water reactor assembly classes

Assembly Class	Array Size	Manufacturer Code	Version	Assembly Code	Length (in.)	Width (in.)	Clad Material
GE BWR/ 2,3	7 × 7	ANF	ANF	G2307A	171.2	5.44	Zircaloy-2
	8 × 8	ANF	ANF	G2308A	171.2	5.44	Zircaloy-2
	9 × 9	ANF	ANF	G2309A	171.2	5.44	Zircaloy-2
			ANF IX	G2309AIX	171.2	5.44	Zircaloy-2
	8 × 8	ANF	ANF Pressurized	G2308AP	171.2	5.44	Zircaloy-2
		GE	GE-10	G2308G10	171.2	5.44	Zircaloy-2
	9 × 9	GE	GE-11	G2309G11	171.2	5.44	Zircaloy-2
	7 × 7	GE	GE-2a	G2307G2A	171.2	5.44	Zircaloy-2
			GE-2b	G2307G2B	171.2	5.44	Zircaloy-2
			GE-3	G2307G3	171.2	5.44	Zircaloy-2
	8 × 8	GE	GE-4	G2308G4	171.2	5.44	Zircaloy-2
			GE-5	G2308G5	171.2	5.44	Zircaloy-2
			GE-7	G2308G7	171.2	5.44	NA
			GE-8a	G2308G8A	171.2	5.44	Zircaloy-2
			GE-8b	G2308G8B	171.2	5.44	Zircaloy-2
			GE-9	G2308G9	171.2	5.44	Zircaloy-2
			GE-Barrier	G2308GB	171.2	5.44	Zircaloy-2
			GE-Pressurized	G2308GP	171.2	5.44	Zircaloy-2
	not available	not available	not available	9X9IXQFA	171.2	5.44	not available
GE BWR/ 4-6	9 × 9	ANF	ANF	G4609A	176.2	5.44	Zircaloy-2
	10 × 10	ANF	ANF	G4610A	176.2	5.44	NA
	9 × 9	ANF	ANF 9-5	G4609A5	176.2	5.44	Zircaloy-2
			ANF 9X	G4609A9X	176.2	5.44	Zircaloy-2
			ANF IX	G4609AIX	176.2	5.44	Zircaloy-2
	10 × 10	ANF	ANF IX	G4610AIX	176.2	5.44	not available
	9 × 9	ANF	ANF X+	G4609AX+	176.2	5.44	not available
	8 × 8	ANF	ANF-Pressurized	G4608AP	176.2	5.44	Zircaloy-2

Table A-2 (continued)

	not available	AREVA	not available	ATRIUM10	176.2	5.44	Zircaloy-2
GE BWR/ 4-6 (Continued)	10 × 10	ABB	CE	G4610C	176.2	5.44	not available
	8 × 8	GE	GE-10	G4608G10	176.2	5.44	Zircaloy-2
			GE-11	G4608G11	176.2	5.44	not available
	9 × 9	GE	GE-11	G4609G11	176.2	5.44	Zircaloy-2
	8 × 8	GE	GE-12	G4608G12	176.2	5.44	not available
	10 × 10	GE	GE-12	G4610G12	176.2	5.44	Zircaloy-2
	9 × 9	GE	GE-13	G4609G13	176.2	5.44	Zircaloy-2
	10 × 10	GE	GE-14	G4610G14	176.2	5.44	not available
	7 × 7	GE	GE-2	G4607G2	176.2	5.44	Zircaloy-2
			GE-3a	G4607G3A	176.2	5.44	Zircaloy-2
			GE-3b	G4607G3B	176.2	5.44	Zircaloy-2
	8 × 8	GE	GE-4a	G4608G4A	176.2	5.44	Zircaloy-2
			GE-4b	G4608G4B	176.2	5.44	Zircaloy-2
			GE-5	G4608G5	176.2	5.44	Zircaloy-2
			GE-8	G4608G8	176.2	5.44	Zircaloy-2
			GE-9	G4608G9	176.2	5.44	Zircaloy-2
			GE-Barrier	G4608GB	176.2	5.44	Zircaloy-2
			GE-Pressurized	G4608GP	176.2	5.44	Zircaloy-2
		WE	WE	G4608W	176.2	5.44	Zircaloy-2
Big Rock Point	9 × 9	ANF	ANF	XBR09A	84	6.52	Zircaloy-2
	11 × 11	ANF	ANF	XBR11A	84	6.52	Zircaloy-2
	7 × 7	GE	GE	XBR07G	84	6.52	not available
	8 × 8	GE	GE	XBR08G	84	6.52	not available
	9 × 9	GE	GE	XBR09G	84	6.52	Zircaloy-2
	11 × 11	GE	GE	XBR11G	84	6.52	Zircaloy-2
		NFS	NFS	XBR11N	84	6.52	not available
Dresden-1	6 × 6	ANF	ANF	XDR06A	134.4	4.28	Zircaloy-2
		GE	GE	XDR06G	134.4	4.28	Zircaloy-2

Table A-2 (continued).

	7 × 7	GE	GE SA-1	XDR07GS	134.4	4.28	not available
	8 × 8	GE	GE PF Fuels	XDR08G	134.4	4.28	not available
	6 × 6	GE	GE Type III-B	XDR06G3B	134.4	4.28	not available
			GE Type III-F	XDR06G3F	134.4	4.28	not available
			GE Type V	XDR06G5	134.4	4.28	not available
		UNC	UNC	XDR06U	134.4	4.28	not available
Humboldt Bay	6 × 6	ANF	6 × 6 ANF	XHB06A	95	4.67	Zircaloy
		GE	GE	XHB06G	95	4.67	Zircaloy-2
	7 × 7	GE	GE Type II	XHB07G2	95	4.67	Zircaloy
La Crosse	10 × 10	AC	AC	XLC10L	102.5	5.62	SS348H
		ANF	ANF	XLC10A	102.5	5.62	SS348H
NOTE: Some characteristics of more recently discharged SNF (post-2002) have not yet been provided.							

Table A-3. Assembly types and their main characteristics as of December 31, 2002

Reactor Type	Manufacturer Code	Assembly Code	Initial Uranium Loading (kg/assembly)		Enrichment (U^{235} wt %)			Burnup (MWd/MTU)	
			Avg.	Max.	Min.	Avg.	Max.	Avg.	Max.
BWR	not available	9X9IXQFA	170.713	170.800	3.25	3.25	3.25	39,166	39,248
BWR	AC	XLC10L	120.160	121.034	3.63	3.77	3.94	14,419	21,532
BWR	ANF	G2307A	181.574	183.797	2.56	2.64	2.65	24,256	27,826
BWR	ANF	G2308A	174.624	184.355	2.39	2.66	3.13	28,814	36,826
BWR	ANF	G2308AP	172.753	173.132	2.82	2.83	2.83	34,366	34,826
BWR	ANF	G2309A	168.097	169.520	2.78	3.10	3.15	35,941	40,818
BWR	ANF	G2309AIX	169.185	170.059	3.25	3.31	3.82	39,151	43,778
BWR	ANF	G4608AP	176.175	176.800	2.62	2.88	3.40	31,248	35,518
BWR	ANF	G4609A	172.970	174.700	0.72	3.42	3.73	36,933	47,000
BWR	ANF	G4609A5	176.147	177.000	2.90	3.28	3.55	36,536	43,555
BWR	ANF	G4609A9X	169.155	176.800	2.53	2.87	3.11	36,880	43,330
BWR	ANF	G4609AIX	174.788	177.000	3.00	3.58	3.94	24,156	36,777
BWR	ANF	G4609AX+	167.264	167.277	3.13	3.14	3.15	39,239	40,457
BWR	ANF	G4610A	176.900	176.900	3.94	3.94	3.94	38,207	39,000
BWR	ANF	G4610AIX	175.000	175.000	3.39	3.39	3.39	37,706	38,009
BWR	ANF	XBR09A	127.687	131.406	3.45	3.48	3.52	20,981	22,811
BWR	ANF	XBR11A	130.237	133.174	3.13	3.42	3.82	22,716	34,212
BWR	ANF	XDR06A	95.206	95.478	2.23	2.23	2.24	4,907	5,742
BWR	ANF	XHB06A	69.734	73.800	2.35	2.40	2.41	9,037	22,377
BWR	ANF	XLC10A	108.657	109.609	3.68	3.69	3.71	15,017	20,126
BWR	AREVA	ATRIUM10	176.900	176.900	3.94	3.94	3.94	38,406	39,000
BWR	ABB	G4610C	175.683	176.300	2.51	3.29	3.62	38,133	42,640
BWR	GE	G2307G2A	194.902	197.604	2.07	2.10	2.11	16,775	24,902
BWR	GE	G2307G2B	193.203	197.400	1.65	2.15	2.62	16,384	29,728

Table A-3 (continued).

Reactor Type	Manufacturer Code	Assembly Code	Initial Uranium Loading (kg/assembly)		Enrichment (U^{235} wt %)			Burnup (MWd/MTU)	
			Avg.	Max.	Min.	Avg.	Max.	Avg.	Max.
BWR	GE	G2307G3	187.419	189.105	1.96	2.41	2.60	25,420	38,861
BWR	GE	G2308G10	172.225	173.512	3.10	3.25	3.56	33,988	43,977
BWR	GE	G2308G4	183.991	185.496	2.19	2.51	2.76	26,087	40,523
BWR	GE	G2308G5	176.971	177.628	2.39	2.66	2.82	29,009	33,597
BWR	GE	G2308G7	178.520	179.400	2.96	2.97	2.99	31,570	35,894
BWR	GE	G2308G8A	175.695	179.584	2.55	3.09	3.40	34,848	44,933
BWR	GE	G2308G8B	172.590	178.000	2.96	3.19	3.39	36,400	42,518
BWR	GE	G2308G9	172.017	173.108	2.85	3.18	3.48	37,268	42,295
BWR	GE	G2308GB	177.983	180.060	2.62	2.80	3.39	32,014	43,381
BWR	GE	G2308GP	177.145	179.200	2.08	2.77	3.01	29,317	38,139
BWR	GE	G2309G11	165.650	169.500	3.10	3.56	3.78	40,522	45,117
BWR	GE	G4607G2	194.729	197.334	1.09	1.56	2.50	9,362	11,829
BWR	GE	G4607G3A	187.455	189.141	1.10	2.33	2.51	21,058	32,188
BWR	GE	G4607G3B	189.925	191.542	1.10	2.31	2.51	21,948	30,831
BWR	GE	G4608G10	177.778	186.094	2.63	3.24	3.70	36,695	44,343
BWR	GE	G4608G11	170.786	171.000	3.38	3.38	3.38	35,194	42,551
BWR	GE	G4608G12	180.873	181.484	3.69	3.71	3.99	32,069	34,462
BWR	GE	G4608G4A	183.931	185.221	2.19	2.62	2.99	24,931	43,430
BWR	GE	G4608G4B	186.709	187.900	2.10	2.31	2.76	21,362	32,941
BWR	GE	G4608G5	183.007	185.366	0.70	2.36	3.01	23,964	38,224
BWR	GE	G4608G8	179.801	185.854	2.95	3.19	3.40	34,905	44,640
BWR	GE	G4608G9	177.738	185.789	1.51	3.23	3.88	36,492	47,062
BWR	GE	G4608GB	184.636	186.653	0.71	2.53	3.25	26,297	45,986
BWR	GE	G4608GP	183.195	186.888	0.70	2.38	3.27	23,112	42,428
BWR	GE	G4609G11	170.123	178.136	1.46	3.56	4.14	40,351	65,149

Table A-3 (continued).

Reactor Type	Manufacturer Code	Assembly Code	Initial Uranium Loading (kg/assembly)		Enrichment (U^{235} wt %)			Burnup (MWd/MTU)	
			Avg.	Max.	Min.	Avg.	Max.	Avg.	Max.
BWR	GE	G4609G13	171.417	172.912	3.24	3.85	4.17	42,045	53,636
BWR	GE	G4610G12	176.100	182.141	3.12	3.98	4.20	44,175	52,735
BWR	GE	G4610G14	179.127	180.402	4.01	4.11	4.24	5,868	8,915
BWR	GE	XBR07G	131.500	133.000	2.88	2.88	2.88	1,643	1,690
BWR	GE	XBR08G	112.500	113.000	2.85	2.85	2.85	4,546	7,027
BWR	GE	XBR09G	137.088	141.000	3.51	3.58	3.62	15,092	22,083
BWR	GE	XBR11G	124.500	132.000	3.11	3.46	3.63	22,802	24,997
BWR	GE	XDR06G	111.352	111.352	1.47	1.47	1.47	23,522	23,522
BWR	GE	XDR06G3B	101.610	102.520	1.83	1.83	1.83	18,632	27,106
BWR	GE	XDR06G3F	102.049	102.876	2.25	2.25	2.25	22,132	28,138
BWR	GE	XDR06G5	105.857	112.257	2.26	2.26	2.26	21,095	25,886
BWR	GE	XDR07GS	59.000	59.000	3.10	3.10	3.10	29,000	29,000
BWR	GE	XDR08G	99.714	99.714	1.95	1.95	1.95	25,287	25,287
BWR	GE	XHB06G	76.355	77.000	2.35	2.43	2.52	17,170	22,876
BWR	GE	XHB07G2	76.325	77.100	2.08	2.11	2.31	18,187	20,770
BWR	NFS	XBR11N	128.991	134.414	2.16	2.83	3.51	18,940	21,850
BWR	UNC	XDR06U	102.021	103.441	1.83	2.24	2.26	17,685	26,396
BWR	WE	G4608W	156.696	171.403	2.69	2.85	3.01	28,041	33,140
PWR	ANF	C1414A	380.870	400.000	0.30	3.50	4.32	38,899	50,871
PWR	ANF	W1414A	378.274	406.840	0.71	3.42	4.50	37,500	56,328
PWR	ANF	W1414ATR	362.788	368.011	2.39	3.38	3.57	38,168	46,000
PWR	ANF	W1515A	428.888	434.792	2.01	3.00	3.60	33,344	49,859
PWR	ANF	W1515AHT	434.546	438.074	3.51	4.08	4.59	45,441	56,922
PWR	ANF	W1515APL	307.361	310.073	1.23	1.55	1.88	27,971	37,770
PWR	ANF	W1717A	413.845	460.540	2.43	4.19	4.77	45,291	53,958

Table A-3 (continued).

Reactor Type	Manufacturer Code	Assembly Code	Initial Uranium Loading (kg/assembly)		Enrichment (U^{235} wt %)			Burnup (MWd/MTU)	
			Avg.	Max.	Min.	Avg.	Max.	Avg.	Max.
PWR	ANF	XFC14A	353.345	358.811	3.50	3.57	3.80	37,205	46,048
PWR	ANF	XPA15A	396.674	408.040	1.50	3.17	4.05	34,362	51,486
PWR	ANF	XYR16A	233.555	237.300	3.49	3.78	4.02	29,034	35,088
PWR	B&W	B1515B	463.398	465.480	2.74	3.57	3.62	40,407	50,128
PWR	B&W	B1515B10	476.778	489.299	3.24	3.90	4.73	44,417	56,880
PWR	B&W	B1515B3	463.845	465.830	1.08	2.42	2.84	21,036	32,267
PWR	B&W	B1515B4	464.285	474.853	0.90	2.91	4.06	29,534	57,000
PWR	B&W	B1515B4Z	463.735	466.305	3.22	3.84	3.95	39,253	51,660
PWR	B&W	B1515B5	468.250	468.250	3.13	3.13	3.13	38,017	39,000
PWR	B&W	B1515B5Z	464.421	465.176	3.20	3.22	3.23	36,016	42,328
PWR	B&W	B1515B6	462.495	464.403	3.22	3.47	3.66	41,790	49,383
PWR	B&W	B1515B7	463.244	464.513	3.48	3.51	3.55	42,059	48,738
PWR	B&W	B1515B8	464.864	468.560	3.29	3.65	4.01	42,692	54,000
PWR	B&W	B1515B9	463.566	467.566	3.29	3.96	4.76	44,097	53,952
PWR	B&W	B1515BGD	429.552	430.255	3.92	3.92	3.92	49,027	58,310
PWR	B&W	B1515BZ	463.410	466.279	3.05	3.47	4.68	37,441	54,023
PWR	B&W	B1717B	456.722	457.929	2.64	2.84	3.04	29,517	33,904
PWR	B&W	W1414B	383.157	383.157	3.22	3.22	3.22	24,398	24,465
PWR	B&W	W1717B	455.799	466.688	2.00	3.84	4.60	40,741	54,014
PWR	B&W	XHN15B	409.913	415.060	3.00	3.99	4.02	33,776	37,833
PWR	B&W	XHN15BZ	363.921	368.072	3.40	3.80	3.91	34,278	42,956
PWR	CE	C1414C	382.437	408.508	1.03	3.20	4.48	33,597	56,000
PWR	CE	C1616CSD	413.912	442.986	1.87	3.62	4.63	37,916	63,328
PWR	CE	C8016C	421.468	442.000	1.92	3.57	4.27	38,490	56,312
PWR	CE	XFC14C	362.313	376.842	1.39	2.96	3.95	32,130	52,125

Table A-3 (continued).

Reactor Type	Manufacturer Code	Assembly Code	Initial Uranium Loading (kg/assembly)		Enrichment (U^{235} wt %)			Burnup (MWd/MTU)	
			Avg.	Max.	Min.	Avg.	Max.	Avg.	Max.
PWR	CE	XPA15C	412.442	416.780	1.65	2.47	3.06	16,020	33,630
PWR	CE	XSL16C	381.018	394.400	1.72	3.44	4.28	38,807	54,838
PWR	CE	XYR16C	228.766	233.400	3.51	3.80	3.92	24,282	35,999
PWR	GA	XHN15HS	406.163	406.163	3.99	3.99	3.99	32,151	32,151
PWR	GA	XHN15HZ	362.863	362.863	3.26	3.26	3.26	18,546	18,546
PWR	NU	XHN15MS	405.979	406.992	3.66	3.66	3.66	28,324	28,324
PWR	NU	XHN15MZ	370.776	371.039	2.95	2.95	2.95	25,643	25,643
PWR	UNC	XYR16U	238.573	241.300	3.96	3.99	4.02	27,461	31,986
PWR	WE	B1515W	461.819	464.763	3.90	4.06	4.22	36,993	49,075
PWR	WE	C1414W	403.483	411.719	2.70	3.15	3.76	30,039	37,781
PWR	WE	W1414W	393.896	403.683	2.26	3.04	3.47	27,315	39,723
PWR	WE	W1414WL	399.092	405.809	2.27	3.07	3.41	31,940	47,932
PWR	WE	W1414WO	355.724	369.265	0.99	3.92	4.95	44,730	69,452
PWR	WE	W1515W	451.193	458.091	2.21	3.00	3.35	29,324	41,806
PWR	WE	W1515WL	455.236	465.600	1.85	2.98	3.80	30,874	55,385
PWR	WE	W1515WO	460.764	465.747	1.91	3.53	4.60	39,071	56,138
PWR	WE	W1515WV5	457.793	462.934	2.99	3.92	4.80	37,556	53,056
PWR	WE	W1717WL	461.323	469.200	1.60	3.12	4.40	32,340	58,417
PWR	WE	W1717WO	425.107	459.433	1.60	3.05	4.02	32,690	53,000
PWR	WE	W1717WP	417.069	417.878	3.73	4.59	4.81	50,707	58,237
PWR	WE	W1717WRF	455.497	456.735	4.00	4.18	4.42	45,530	48,037
PWR	WE	W1717WV	425.399	426.042	4.21	4.38	4.41	44,263	48,385
PWR	WE	W1717WV+	424.010	465.469	1.61	4.16	4.66	45,430	61,685
PWR	WE	W1717WV5	424.269	430.925	1.49	4.01	4.95	43,872	56,570
PWR	WE	W1717WVH	461.954	473.962	2.11	3.87	4.95	41,081	55,496

Table A-3 (continued).

Reactor Type	Manufacturer Code	Assembly Code	Initial Uranium Loading (kg/assembly)		Enrichment (U^{235} wt %)			Burnup (MWd/MTU)	
			Avg.	Max.	Min.	Avg.	Max.	Avg.	Max.
PWR	WE	W1717WVJ	461.518	465.200	3.71	3.99	4.40	43,922	46,847
PWR	WE	WST17W	540.480	546.600	1.51	3.38	4.41	35,926	54,399
PWR	WE	XFC14W	374.055	376.000	0.27	3.75	4.25	38,521	51,971
PWR	WE	XHN15W	415.557	421.227	3.02	3.59	4.00	27,922	35,196
PWR	WE	XHN15WZ	384.894	386.689	4.20	4.39	4.60	14,321	19,376
PWR	WE	XIP14W	191.152	200.467	2.83	4.12	4.36	16,471	27,048
PWR	WE	XSO14W	368.153	374.885	3.16	3.87	4.02	27,232	39,275
PWR	WE	XSO14WD	373.323	373.643	4.01	4.01	4.02	18,259	18,424
PWR	WE	XSO14WM	311.225	311.225	0.71	0.71	0.71	19,307	19,636
PWR	WE	XYR18W	273.350	274.100	4.94	4.94	4.94	25,484	31,755

Appendix B

December 2020 Projected Inventory by Reactor

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Table B-1. Estimated Inventory at Operating Reactors by Storage Type and Site (Group B & C Sites)

Reactor	Dry Inventory 12/31/2020			Pool Inventory 12/31/2020		Site Inventory 12/31/2020	
	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Arkansas Nuclear One (2)	2,576	1,140	96	1,192	528	3,768	1,668
Beaver Valley Power Station (2)	518	239	14	2,422	1,119	2,940	1,358
Braidwood Station (2)	1,120	471	35	2,508	1,054	3,628	1,525
Browns Ferry Nuclear Plant (3)	6,709	1,210	86	7,296	1,316	14,005	2,525
Brunswick Steam Electric Plant (2)	2,562	505	42	2,333	459	4,895	964
Byron Station (2)	1,184	498	37	2,738	1,152	3,922	1,650
Callaway Plant (1)	666	282	18	1,506	637	2,172	919
Calvert Cliffs Nuclear Power Plant (2)	2,624	1,031	94	1,406	552	4,030	1,583
Catawba Nuclear Station (2)	1,501	672	49	2,069	927	3,570	1,599
Clinton Power Station (1)	979	177	11	2,933	531	3,912	708
Columbia Generating Station (1)	3,060	540	45	1,532	271	4,592	811
Comanche Peak Steam Electric Station (2)	1,344	566	42	2,113	890	3,457	1,455
Cooper Nuclear Station (1)	1,830	330	30	1,408	254	3,238	584
Davis-Besse Nuclear Station (1)	496	236	15	931	444	1,427	680
Diablo Canyon Nuclear Power Plant (2)	1,856	797	58	1,806	776	3,662	1,573
Donald C. Cook Nuclear Power Plant (2)	1,408	617	44	2,856	1,252	4,264	1,869
Dresden Nuclear Power Station (2)	5,508	969	81	5,539	929	11,047	1,898
Edwin I. Hatch Nuclear Plant (2)	5,780	1,041	85	4,122	742	9,902	1,783
Fermi (1)	1,564	276	23	2,390	423	3,954	699
Grand Gulf Nuclear Station (1)	2,448	436	36	3,652	651	6,100	1,087
H.B. Robinson Steam Electric Plant (1)	728	315	36	214	93	942	407
Hope Creek Generating Station (1)	2,312	416	34	2,614	470	4,926	886
Indian Point Nuclear Generating (1)**	1,504	683	47	158	73	1,662	757
James A. FitzPatrick Nuclear Power Plant (1)	2,176	395	32	2,051	372	4,227	767
Joseph M. Farley Nuclear Plant (2)	1,696	742	53	1,909	836	3,605	1,578
LaSalle County Station (2)	2,788	500	41	6,731	1,206	9,519	1,706
Limerick Generating Station (2)	3,355	600	55	6,176	1,104	9,531	1,704
McGuire Nuclear Station (2)	1,954	882	64	2,187	987	4,141	1,868
Millstone Power Station (2)	1,312	557	41	2,185	928	3,497	1,485
Monticello Nuclear Generating Plant (1)	1,830	318	30	879	153	2,709	471
Nine Mile Point Nuclear Station (2)	2,440	433	40	6,152	1,091	8,592	1,524
North Anna Power Station (2)	2,176	1,009	68	1,262	585	3,438	1,594
Oconee Nuclear Station (3)	3,840	1,799	160	1,429	669	5,269	2,468
Palisades Nuclear Plant (1)	1,355	559	49	474	195	1,829	754
Palo Verde Nuclear Generating Station (3)	3,907	1,682	159	2,558	1,101	6,465	2,784
Peach Bottom Atomic Power Station (2)	6,523	1,176	95	5,572	1,005	12,095	2,181

Table B-1 (continued)

Reactor	Dry Inventory 12/31/2020			Pool Inventory 12/31/2020		Site Inventory 12/31/2020	
	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Perry Nuclear Power Plant (1)	1,700	306	25	2,925	527	4,625	833
Point Beach Nuclear Plant (2)	1,472	565	50	1,265	486	2,737	1,051
Prairie Island Nuclear Generating Plant (2)	1,880	694	47	949	350	2,829	1,044
Quad Cities Nuclear Power Station (2)	4,216	747	62	6,278	1,113	10,494	1,860
River Bend Station (1)	2,108	375	31	2,269	404	4,377	779
R.E. Ginna Nuclear Power Plant (1)	448	167	14	1,060	395	1,508	561
St. Lucie Plant (2)	1,312	511	41	2,805	1,092	4,117	1,603
Salem Nuclear Generating Station (2)	1,120	514	35	2,491	1,143	3,611	1,657
Seabrook Station (1)	704	322	22	906	415	1,610	737
Sequoyah Nuclear Plant (2)	2,148	982	64	1,533	701	3,681	1,684
Shearon Harris Nuclear Power Plant (1)	0	0	0	6,281	1,631	6,281	1,631
South Texas Project (2)	444	238	12	2,556	1,369	3,000	1,607
Surry Nuclear Power Station (2)	2,750	1,261	95	720	330	3,470	1,591
Susquehanna Steam Electric Station (2)	7,138	1,261	121	3,877	685	11,015	1,945
Turkey Point Nuclear Generating (2)	896	408	28	2,426	1,104	3,322	1,511
Virgil C. Summer Nuclear Station (1)	296	126	8	1,344	574	1,640	700
Vogtle Electric Generating Plant (2)	1,312	565	41	2,462	1,059	3,774	1,624
Waterford Steam Electric Station (1)	992	419	31	1,164	491	2,156	910
Watts Bar Nuclear Plant (2)	555	256	15	978	451	1,533	706
Wolf Creek Generating Station (1)	0	0	0	1,846	847	1,846	847
Totals (89 reactors)	**117,120**	**33,815**	**2,687**	**141,438**	**40,939**	**258,558**	**74,754**

*Note: This Table does reflect SNF transfers.
Dresden quantities include 617 Dresden Unit 1 assemblies (~63.2MTU) which are co-mingled with unit 2 and 3 SNF and which are being moved to dry canister storage in a co-mingled fashion.
** Dry storage at Indian Point includes both Unit 2 and 3 SNF

Table B-2. Estimated Inventory by Storage Type and Site (Group A Sites Shutdown before 2000)

	Dry Inventory 12/31/2020			Pool Inventory 12/31/2020		Site Inventory 12/31/2020	
Reactor	**Assy.**	**Initial Uranium (MT)**	**SNF Casks**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Big Rock Point	441	57.92	7	-	-	441	57.92
Haddam Neck	1,019	413.53	40	-	-	1,019	413.53
Humboldt Bay	390	28.94	5	-	-	390	28.94
La Crosse	333	37.97	5	-	-	333	37.97
Maine Yankee	1,434	542.26	60	-	-	1,434	542.26
Rancho Seco	493	228.38	21	-	-	493	228.38
Trojan	790	359.26	34	-	-	790	359.26
Yankee Rowe	533	127.13	15	-	-	533	127.13
Zion	2,226	1,019.41	61	-	-	2,226	1,019.41
Totals	**7,659**	**2,814.79**	**248**	**-**	**-**	**7,659**	**2,814.79**

*Note: This Table **does** reflect SNF transfers.

Table B-3. Estimated Inventory by Storage Type and Site (Shutdown Reactors at Group B Sites)

	Dry Inventory 12/31/2020			Pool Inventory 12/31/2020		Site Inventory 12/31/2020	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**SNF Casks**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Dresden 1	272	27.72	4	Pool Empty	Remaining Inventory with Units 2 and 3**	272	27.71
Indian Point 1	160	30.58	5	-	-	160	30.58
Indian Point 2***	0	0.00	0	1,982	899.14	1,982	899.14
Millstone 1	-	-	-	2,884	525.62	2,884	525.62
Totals	**432**	**58.30**	**9**	**4,866**	**1,424.76**	**5,298**	**1,483.07**

*Note: This Table **does** reflect SNF transfers.

** 617 Dresden 1 assemblies (~63.2MTU) are co-mingled with unit 2 and 3 SNF. This SNF is being moved to dry canister storage in a co-mingled fashion.

*** Dry storage of Indian Point 2 SNF is shown with Unit 3 SNF in Table B-1

Table B-4. Estimated Inventory by Storage Type and Site (Group A Sites Shutdown Post 2000)

	Dry Inventory 12/31/2020			Pool Inventory 12/31/2020		Site Inventory 12/31/2020	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**SNF Casks**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Fort Calhoun	1,264	466	40	-	-	1,264	466
Vermont Yankee	3,879	706	58	-	-	3,879	706
Crystal River	1,243	582	39	-	-	1,243	582
Kewaunee	1,335	519	38	-	-	1,335	519
San Onofre	3,855	1,609	123	-	-	3,855	1,609
Duane Arnold	1,830	331	30	1,818	329	3,648	660
Oyster Creek Nuclear Generating Station	2,074	367	34	2,430	430	4,504	797
Pilgrim Nuclear Power Station	1,904	338	28	2,209	393	4,113	731
Three Mile Island	-	-	-	1,663	786	1,663	786
Totals	**17,385**	**4,919**	**390**	**8,120**	**1,937**	**25,504**	**6,856**

*Note: This Table **does** reflect SNF transfers.

Table B-5. Estimated Inventory Totals

	Dry Inventory 12/31/2020			Pool Inventory 12/31/2020		Site Inventory 12/31/2020	
Reactor Group	**Assy.**	**Initial Uranium (MT)**	**SNF Casks**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Operating Sites	117,120	33,815	2,687	141,438	40,939	258,558	74,754
Group A Pre-2000 All Dry Storage	7,659	2,815	248	-	-	7,659	2,815
Group A Post-2000 All Dry Storage	432	58	9	4,866	1,425	5,298	1,483
Group A Post 2000 All Pool Storage	11,576	3,882	298	-	-	11,576	3,882
Group A Post 2000 Pool and Dry Storage	0	0	0	1,663	786	1,663	786
Shutdown Group B	5,808	1,036	92	6,457	1,152	12,265	2,188
Grand Total	**142,595**	**41,606**	**3,334**	**154,424**	**44,302**	**297,019**	**85,908**

*Note: This Table **does** reflect SNF transfers.

Table B-6 Bare SNF Storage Systems Currently in Use

Utility	Reactor	Cask System	Licensed Purpose	Casks Loaded	Assemblies	MTiHM
Dominion	North Anna	TN-32	Storage Only	28	896	415.1
Dominion	Surry	CASTOR V/21	Storage Only	25	525	240.8
Dominion	Surry	CASTOR X/33	Storage Only	1	33	15.1
Dominion	Surry	MC-10	Storage Only	1	24	11.0
Dominion	Surry	NAC I28 S/T	Storage Only	2	56	25.7
Dominion	Surry	TN-32	Storage Only	26	832	381.7
Duke	McGuire	TN-32 (Note 1)	Storage Only	10	320	143.9
Exelon	Peach Bottom 2 & 3	TN-68	Storage and Transportation	92	6,256	1,127.9
Xcel Energy	Prairie Island	TN-40 HT	Storage and Transportation	18	720	270.6
		TN-40	Storage and Transportation	29	1160	423.4
4 Total Utilities	5 Total Reactor Sites	7 Unique Cask Systems Used	3 Reactor/Cask System Combinations Licensed for Storage and Transportation	232 Casks Loaded	10,822 Assemblies Loaded	3,055 MTiHM Loaded
			7 Reactor/Cask System Combinations Licensed for Storage Only			

1. The TN-32 casks used at McGuire are TN-32A models

Table B-7 Canister Based Storage Systems Currently in Use

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
Humboldt Bay	HI-STAR 100HB	MPC-HB	SNM-2514	S.L.	5	390	28.9
La Crosse	NAC-MPC	LACBWR	1025	6	5	333	38.0
Rancho Seco	Standardized NUHOMS	NUHOMS FC-DSC	SNM-2510	S.L.	18	432	200.1
Rancho Seco	Standardized NUHOMS	NUHOMS FF-DSC		S.L.	1	13	6.0
Rancho Seco	Standardized NUHOMS	NUHOMS FO-DSC		S.L.	2	48	22.2
Yankee Rowe	NAC-MPC	Yankee-MPC	1025	1(8)/5 2(7)/5	15	533	127.1
GE Trojan	HI-STORM TranStor	MPC-24E (TranStor)	SNM-2509	S.L.	29	674	306.6
GE Trojan	HI-STORM TranStor	MPC-24EF (TranStor)		S.L	5	116	52.7
Maine Yankee	NAC-UMS	UMS-PWR	1015	2/5	60	1434	542.3
Connecticut Yankee	NAC-MPC	CY-MPC, 26 Assy	1025	3(26)/5 4(14)/5	40	1019	413.5
Big Rock Point	FuelSolutions[5]	W74T	1026	2	7	441	57.9
Zion	NAC-MAGNASTOR	TSC4 (PWR)	1031	3/6	61	2226	1,019.4
Crystal River	Standardized NUHOMS	NUHOMS 32PTH1 Type 2-W	1004	14	39	1243	582
Kewaunee	Standardized NUHOMS	NUHOMS 32PT-S100	1004	9(4)/9R1 10(10)/10R1	14	448	174.0
Kewaunee	NAC-MAGNASTOR	TSC2 (PWR)	1031	5/6	24	887	345.0
SONGS	Advanced NUHOMS	NUHOMS 24PT1	1029	0/4	17	395	160.1
SONGS	Advanced NUHOMS	NUHOMS 24PT4	1029	1/4	33	792	320.9
SONGS	HI-STORM UMAX	MPC-37	1040	Unknown (3) 2(70)	73	2668	1128.0
Vermont Yankee	HI-STORM 100	MPC-68	1014	2	13	884	160.9

Table B-7 (continued)

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
Vermont Yankee	HI-STORM 100 S-B	MPC-68	1014	10	10	680	123.8
Vermont Yankee	HI-STORM 100 S-B	MPC-68M	1014	10	35	2315	421.3
Fort Calhoun	Standardized NUHOMS	NUHOMS 32PT-S100	1004	8(4) 9(6) 15(30)	40	1,264	466.0
Oyster Creek	Standardized NUHOMS	NUHOMS 61BT	1004	4(11) 7(7) 9(1)	19	1159	205.0
Oyster Creek	Standardized NUHOMS	NUHOMS 61BTH	1004	10	4	244	43.2
Oyster Creek	Standardized NUHOMS	NUHOMS 61BTH Type 1	1004	10	11	671	118.8
Three Mile Island	NAC-MAGNASTOR	TSC4 (PWR)	1031		0	0	0
Pilgrim	HI-STORM 100	MPC-68	1014	7(17)/14 12(11)/14	28	1904	338.0
Duane Arnold	Standardized NUHOMS	NUHOMS 61BT	1004	4(10) 9(10)	20	1220	220.7
Duane Arnold	Standardized NUHOMS	NUHOMS 61BTH	1004	15(10)	10	610	110.3
Indian Point	HI-STORM 100	MPC-32	1014	4	5	160	30.6
Indian Point	HI-STORM 100	MPC-32	1014	Unknown(3) 2(11) 6(23) 9R1(10)	47	1504	683.0
Palisades	VSC-24	MSB-Standard	1007	Unknown	18	432	177.5
Palisades	Standardized NUHOMS	NUHOMS 24PTH-S	1004	9/9R1	13	312	128.2
Palisades	Standardized NUHOMS	NUHOMS 32PT-S125	1004	7/7R1	11	352	144.6
Palisades	HI-STORM FW	MPC-37	1032	1R1	7	259	108.7
Diablo Canyon	HI-STORM 100 (anchored)	MPC-32 (Diablo)	SNM-2511	S.L.	58	1856	797.0

Table B-7 (continued)

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
Ginna	Standardized NUHOMS	NUHOMS 32PT-S125	1004	Unknown (4) 10(6) 13R1(4)	14	448	167.0
Robinson	NUHOMS 0708	NUHOMS 07P		Unknown	8	56	24.2
Robinson	Standardized NUHOMS	NUHOMS 24PTH-L	1004	8(4)/8R1 9(4)/9R1 10(10)/10R1 13(5)/13R1 13R1(5)	28	672	290.8
Monticello	Standardized NUHOMS	NUHOMS 61BT	1004	9	10	610	105.6
Monticello	Standardized NUHOMS	NUHOMS 61BTH	1004	10(6) 10R1(14)	20	1220	212.4
Dresden	HI-STAR 100	MPC-68F	1008	Unknown(1) 2(3)	4	272	27.7
Dresden	HI-STORM 100	MPC-68	1014	Unknown(9) 2(47) 8R1(1)	57	3876	681.9
Dresden	HI-STORM 100	MPC-68F	1014	Unknown(1) 2(2)	3	204	35.8
Dresden	HI-STORM 100	MPC-68M	1014	8(3)/8R1 8R1(3)	6	408	71.7
Dresden	HI-STORM 100S	MPC-68M	1014	8R1	15	1020	179.4
Quad Cities	HI-STORM 100 S-B	MPC-68	1014	Unknown (5) 2(4) 3(28) 8(2)	39	2652	469.9
Quad Cities	HI-STORM 100 S-B	MPC-68M	1014	8(2) 8R1(21)	23	1564	277.1
Point Beach	VSC-24	MSB-Short	1007	Unknown	16	384	147.4

Table B-7 (continued)

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
Point Beach	Standardized NUHOMS	NUHOMS 32PT	1004	Unknown (14) 10(9) 13(5) 14(6)	34	1088	417.6
Cooper	Standardized NUHOMS	NUHOMS 61BT	1004	9/9R1	8	488	88.0
Cooper	Standardized NUHOMS	NUHOMS 61BTH	1004	Unknown (4) 10(10)/10R1 10(8)/13R1	22	1342	242.0
Oconee	Standardized NUHOMS	NUHOMS 24P	1004	Unknown (36) 3(3) 4(2) 6(1) 7(2)	44	1056	494.8
Oconee	Standardized NUHOMS	NUHOMS 24PHBL	1004	8(6) 9(42) 13(14)	62	1488	697.1
Oconee	Standardized NUHOMS	NUHOMS 24PTH	1004	Unknown (37) 13R1(17)	54	1296	607.1
Fitzpatrick	HI-STORM 100	MPC-68	1014	Unknown (18) 5(8)	26	1768	321.0
Fitzpatrick	HI-STORM 100	MPC-68 M	1014	8R1	6	408	74.0
Brunswick	Standardized NUHOMS	NUHOMS 61BTH Type 2	1004	Unknown (5) 10(27) 13R1(10)	42	2562	505.0
Browns Ferry	HI-STORM 100	MPC-68	1014	Unknown(3) 1(3) 5(39)	45	3060	551.8
Browns Ferry	HI-STORM FW	MPC-89	1014	Unknown (1) 0(19)/0R1 0R1(21)	41	3649	658.2

Table B-7 (continued)

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
Calvert Cliffs	Standardized NUHOMS	NUHOMS 24P	1004	Unknown	48	1152	452.6
Calvert Cliffs	Standardized NUHOMS	NUHOMS 32P	1004	Unknown	30	960	377.2
Calvert Cliffs	Standardized NUHOMS	NUHOMS 32PHB	1004	Unknown	16	512	201.2
Davis-Besse	Standardized NUHOMS	NUHOMS 24P	1004	0/0R1	3	72	34.3
Davis-Besse	Standardized NUHOMS	NUHOMS 32PH1	1004	13R1	4	128	60.9
Davis-Besse	Standardized NUHOMS	NUHOMS 37PTH	1004	0	8	296	140.8
D. C. Cook	HI-STORM 100S	MPC-32	1014	5(28) 9(3)/9R1 9R1(13)	44	1408	617
Hatch	HI-STAR 100	MPC-68 (HI-STAR)	1008	Unknown	3	204	36.7
Hatch	HI-STORM 100	MPC-68 (HI-STORM)	1014	Unknown (14) 2(17) 3(27) 9(2)/9R1	60	4080	734.8
Hatch	HI-STORM 100	MPC-68M	1014	9(2)/9R1 9R1(20)	22	1496	269.4
ANO	VSC-24	MSB-Long	1007	Unknown	24	576	254.9
ANO	HI-STORM 100	MPC-24		Unknown (4) 1(9) 2(8) 5(17)	38	912	403.6
ANO	HI-STORM 100	MPC-32		1(4) 2(8) 5(18) 13(4)	34	1088	481.5
Salem	HI-STORM 100	MPC-32	1014	5	35	1120	514.0

Table B-7 (continued)

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
North Anna	NUHOMS HD	MPC-32PTH		Unknown (3) 0(10) 1(27)	40	1280	593.9
Farley	HI-STORM 100	MPC-32		Unknown (8) 3(21) 9(8)/9R1 9R1(16)	53	1696	742.0
Sequoyah	HI-STORM 100	MPC-32	1014	Unknown (3) 1(5) 2(12) 5(24)	44	1408	643.7
Sequoyah	HI-STORM FW	MPC-37	1032	0(5) 0R1(10) 3(5)	20	740	338.3
V. C. Summer	HI-STORM FW	MPC-37	1032	0(4)/0R1 0R1(4)	8	296	126.0
McGuire	NAC-UMS	UMS-PWR	1015	3(5)/4 4(23)	28	672	303.3
McGuire	NAC-MAGNASTOR	TSC4 (PWR)	1031	2(10)/7 2R1(6)/7 7(10)	26	962	434.8
St. Lucie	NUHOMS HD	NUHOMS 32PTH	1030	Unknown (3) 0(6) 1(17) 2(15)	41	1312	511.0
Catawba	NAC-UMS	UMS-PWR	1015	4	24	576	257.6
Catawba	NAC-MAGNASTOR	TSC4 (PWR)	1031	2(6)/7 2R1(9)/7 7(10)	25	925	414.4
LaSalle	HI-STORM 100	MPC-68	1014	3	24	1632	292.7
LaSalle	HI-STORM 100	MPC-68 M	1014	8R1(17)	17	1156	207.3

Table B-7 (continued)

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
Columbia	HI-STORM 100	MPC-68	1014	1(15) 2(21) 9R1(9)	45	3060	540.0
Susquehanna	Standardized NUHOMS	NUHOMS 52B	1004	Unknown	27	1404	248.0
Susquehanna	Standardized NUHOMS	NUHOMS 61BT	1004	Unknown (22) 9(26)	48	2928	517.0
Susquehanna	Standardized NUHOMS	NUHOMS 61BTH	1004	10	15	915	161.6
Susquehanna	NUHOMS HSM 102	NUHOMS 61BTH	1004	Unknown (3) 10(6) 10R1(6) 14(16)	31	1891	334.1
Callaway	HI-STORM UMAX	MPC-37	1040	0	18	666	282.0
Grand Gulf	HI-STORM 100	MPC-68	1014	2(7) 5(21) 9R1(2)	30	2040	363.3
Grand Gulf	HI-STORM 100	MPC-68 M	1014	Unknown	6	408	72.6
Waterford	HI-STORM 100	MPC-32	1014	5(23) 13(8)	31	992	419.0
Wolf Creek	NUHOMS Matrix MX HSM	NUHOMS EOS	1042		0	0	0
Fermi	HI-STORM 100	MPC-68	1014	5(12)	12	816	144.0
Fermi	HI-STORM 100	MPC-68 M		10(11)	11	748	132.0
River Bend	HI-STORM 100	MPC-68	1014	Unknown (7) 5(24)	31	2108	375.0
Millstone	Standardized NUHOMS	NUHOMS 32PT-S100	1004	Unknown (3) 7(2)/9 8(3) 9(10)	18	576	244.5

Table B-7 (continued)

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
Millstone	Standardized NUHOMS	NUHOMS 32PT-L125	1004	13(13) 14(3) 15(7)	23	736	312.5
Hope Creek	HI-STORM 100	MPC-68	1014	Unknown (11) 3(3) 5(20	34	2312	416.0
Clinton	HI-STORM FW	MPC-89	1032	Unknown (1) 0R1(10)	11	979	177.0
Nine Mile Point	Standardized NUHOMS	NUHOMS 61BT	1004	10	16	976	173.2
Nine Mile Point	Standardized NUHOMS	NUHOMS 61BTH	1004	10(13) 10R1(6) 14(5)	24	1464	259.8
Byron	HI-STORM 100S	MPC-32	1014	3(5) 7(9) 9(6)/9R1 9R1(17)	37	1184	498.0
Perry	HI-STORM 100	MPC-68	1014	5	25	1700	306.0
Beaver Valley	Standardized NUHOMS	NUHOMS 37PTH-S	1004	13(4)/13R1 13R1(6)	10	370	170.7
Beaver Valley	NUHOMS EOS	NUHOMS 37PTH	1042	1	4	148	68.3
Palo Verde	NAC-UMS	UMS-PWR	1015	2(16)/5 3(18)/5 4(24)/5 5(94)	152	3648	1570.5
	NAC MAGNASTOR	TSC2 (PWR)	1031	7	7	259	111.5
Braidwood	HI-STORM 100	MPC-32	1014	Unknown (2) 3(7) 9(11)/9R1 9R1(15)	35	1120	471.0
South Texas	HI-STORM FW	MPC-37	1032	2	12	444	238.0

Table B-7 (continued)

Reactor	Cask System [1]	Canister [2]	License or CoC	Amendment[3]	Canisters Loaded [4]	Assemblies [4]	MTiHM [4]
Limerick	Standardized NUHOMS HSM 202	NUHOMS 61BT	1004	9	16	976	174.5
Limerick	Standardized NUHOMS HSM 202	NUHOMS 61BTH	1004	9(3) 10(5)	8	488	87.2
Limerick	Standardized NUHOMS HSM H	NUHOMS 61BTH	1004	10	31	1891	338.2
Seabrook	NUHOMS HD	NUHOMS 32PTH	1030	0(6)/1 1(8) 2(8)	22	704	322.0
Surry	NUHOMS HD	NUHOMS 32PTH	1030	0(12) 1(28)	40	1280	586.7
Comanche Peak	HI-STORM 100	MPC-32	1014	7	42	1344	566.0
Turkey Point	NUHOMS HD	NUHOMS 32PTH	1030	1(18) 2(10)	28	896	408.0
Peach Bottom	HI-STORM FW	MPC-89	1032	1R1	3	267	48.1
Watts Bar	HI-STORM FW	MPC-37	1032	Unknown (2) 0(6)/0R1 0R1(7)	15	555	256.0
Vogtle	HI-STORM 100	MPC-32	1014	7(6) 9(10)/9R1 9R1(25)	41	1312	565.0
Total Vertical					**1,993**	**88,169**	**25,613**
Total Horizontal					**1,109**	**43,604**	**12,938**
Grand Total					**3,102**	**131,773**	**38,551**

1. Some Cask Systems are listed twice for a given reactor since more than one canister type is used for a given system.
2. The specific Canister variant is listed where known, otherwise a more generic canister description is provided. Horizontal storage systems are shaded.

Table B-7 (continued)

3. A(Z)/A2 where: A=Amendment number at the time of canister loading; Z = number of canisters loaded under amendment A if different from the total number of same type canisters are loaded; A2 is the current amendment the canisters are managed under, if different from A. For example, "0(6)/0R1" indicates 6 canisters were loaded under amendment 0 and are currently managed under amendment 0 Rev 1.

   S.L is used for canisters loaded under a specific license requirement.

   Unknown amendment number indicates either the information is not supplied in the cask registration letter send to the NRC or the cask registration letter could not be found in the ADAMS database.

4. The inventory is current to December 31, 2020 as described in the report, *Spent Nuclear Fuel and Reprocessing Waste Inventory*, FCRD-NFST-2013-000263, Revision 8, October, 2021.

5. Now Westinghouse.

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Appendix C

Reference Scenario: No Replacement Nuclear Generation Forecast – Discharged SNF by Reactor

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Table C-1. No Replacement Nuclear Generation SNF Forecast: Discharges by Operating Reactor

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Arkansas Nuclear One, Unit 1	1,576	737	116	57	699	344	2,391	1,138
Arkansas Nuclear One, Unit 2	1,900	799	176	76	1,145	492	3,221	1,367
Beaver Valley Power Station, Unit 1	1,495	690	124	57	777	357	2,396	1,104
Beaver Valley Power Station, Unit 2	1,195	552	126	58	1,228	571	2,549	1,181
Braidwood Station, Unit 1	1,603	675	182	76	1,740	726	3,525	1,477
Braidwood Station, Unit 2	1,663	699	180	75	1,813	753	3,656	1,527
Browns Ferry Nuclear Plant, Unit 1	3,032	554	580	103	2,504	447	6,116	1,104
Browns Ferry Nuclear Plant, Unit 2	5,306	956	281	50	2,731	486	8,318	1,492
Browns Ferry Nuclear Plant, Unit 3	4,222	758	584	104	2,808	500	7,614	1,362
Brunswick Steam Electric Plant, Unit 1	4,044	727	478	86	2,233	401	6,755	1,214
Brunswick Steam Electric Plant, Unit 2	4,233	763	227	41	2,149	387	6,609	1,191
Byron Station, Unit 1	1,819	766	182	76	1,649	686	3,650	1,528
Byron Station, Unit 2	1,741	733	180	75	1,723	720	3,644	1,528

Table C-1 (continued)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Callaway Plant	1,998	846	174	73	1,498	625	3,670	1,544
Calvert Cliffs Nuclear Power Plant, Unit 1	1,904	746	196	79	805	327	2,905	1,152
Calvert Cliffs Nuclear Power Plant, Unit 2	1,835	719	97	40	993	404	2,925	1,163
Catawba Nuclear Station, Unit 1	1,677	751	154	71	1,348	617	3,179	1,439
Catawba Nuclear Station, Unit 2	1,585	708	154	70	1,348	612	3,087	1,390
Clinton Power Station, Unit 1	3,592	650	320	58	3,344	607	7,256	1,315
Columbia Generating Station, Unit 2	4,344	767	248	44	3,492	622	8,084	1,433
Comanche Peak Steam Electric Station, Unit 1	1,651	700	184	78	1,941	819	3,776	1,597
Comanche Peak Steam Electric Station, Unit 2	1,438	601	184	77	2,125	893	3,747	1,571
Cooper Nuclear Station	3,964	722	330	59	1,538	278	5,832	1,059
Davis-Besse Nuclear Power Station, Unit 1	1,273	605	154	75	793	388	2,220	1,068
Diablo Canyon Nuclear Power Plant, Unit 1	1,680	723	186	79	379	160	2,245	962
Diablo Canyon Nuclear Power Plant, Unit 2	1,608	692	188	80	475	201	2,271	973

Table C-1 (continued)

Reactor [Unit]	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)
Donald C. Cook Nuclear Power Plant, Unit 1	2,075	936	174	79	976	441	3,225	1,456
Donald C. Cook Nuclear Power Plant, Unit 2	1,849	785	166	69	1,106	462	3,121	1,316
Dresden Nuclear Power Station, Unit 2	5,729	1,021	248	43	1,716	296	7,693	1,360
Dresden Nuclear Power Station, Unit 3	4,708	830	498	86	1,720	297	6,926	1,213
Edwin I. Hatch Nuclear Plant, Unit 1	4,658	841	454	82	1,922	345	7,034	1,268
Edwin I. Hatch Nuclear Plant, Unit 2	4,566	821	224	40	2,576	462	7,366	1,323
Fermi, Unit 2	3,580	632	374	67	3,756	673	7,710	1,372
Grand Gulf Nuclear Station, Unit 1	5,452	969	648	118	4,688	854	10,788	1,941
H. B. Robinson Steam Electric Plant, Unit 2	1,687	732	64	28	477	206	2,228	966
Hope Creek Generating Station, Unit 1	4,488	807	438	79	4,487	805	9,413	1,691
Indian Point Nuclear Generating, Unit 3	1,568	714	94	42	193	88	1,855	844
James A. FitzPatrick Nuclear Power Plant	4,028	731	199	36	1,953	350	6,180	1,117
Joseph M. Farley Nuclear Plant, Unit 1	1,715	755	132	56	883	373	2,730	1,184

Table C-1 (continued)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Joseph M. Farley Nuclear Plant, Unit 2	1,626	711	132	56	1,015	429	2,773	1,196
LaSalle County Station, Unit 1	4,264	765	600	107	3,764	672	8,628	1,544
LaSalle County Station, Unit 2	4,360	781	295	53	4,304	767	8,959	1,601
Limerick Generating Station, Unit 1	4,510	804	556	100	3,822	684	8,888	1,588
Limerick Generating Station, Unit 2	4,193	750	272	49	4,572	830	9,037	1,629
McGuire Nuclear Station, Unit 1	1,803	811	144	66	1,129	517	3,076	1,394
McGuire Nuclear Station, Unit 2	1,750	786	144	66	1,201	550	3,095	1,402
Millstone Power Station, Unit 2	1,717	679	148	59	883	354	2,748	1,092
Millstone Power Station, Unit 3	1,462	669	170	77	1,553	706	3,185	1,452
Monticello Nuclear Generating Plant, Unit 1	3,612	642	155	27	1,259	219	5,026	888
Nine Mile Point Nuclear Station, Unit 1	3,768	671	148	25	1,124	193	5,040	889
Nine Mile Point Nuclear Station, Unit 2	4,052	716	624	112	4,508	807	9,184	1,635
North Anna Power Station, Unit 1	1,561	723	130	60	937	433	2,628	1,216

Table C-1 (continued)

Reactor [Unit]	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Initial Uranium (MT)
North Anna Power Station, Unit 2	1,615	749	132	62	949	442	2,696	1,253
Oconee Nuclear Station, Unit 1	1,775	829	136	64	517	244	2,428	1,137
Oconee Nuclear Station, Unit 2	1,741	816	70	33	597	285	2,408	1,134
Oconee Nuclear Station, Unit 3	1,699	795	148	71	621	295	2,468	1,161
Palisades Nuclear Plant	1,701	699	128	55	268	115	2,097	869
Palo Verde Nuclear Generating Station, Unit 1	1,958	841	210	92	1,921	840	4,089	1,773
Palo Verde Nuclear Generating Station, Unit 2	1,974	848	210	92	2,026	886	4,210	1,826
Palo Verde Nuclear Generating Station, Unit 3	1,893	815	220	97	2,221	974	4,334	1,886
Peach Bottom Atomic Power Station, Unit 2	5,600	1,009	576	104	5,372	974	11,548	2,087
Peach Bottom Atomic Power Station, Unit 3	5,636	1,017	285	52	5,609	1,018	11,530	2,087
Perry Nuclear Power Plant, Unit 1	4,344	783	281	50	4,401	787	9,026	1,620
Point Beach Nuclear Plant, Unit 1	1,336	513	94	37	403	158	1,833	708
Point Beach Nuclear Plant, Unit 2	1,222	468	94	37	497	197	1,813	702

Table C-1 (continued)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Prairie Island Nuclear Generating Plant, Unit 1	1,307	482	104	39	433	162	1,844	683
Prairie Island Nuclear Generating Plant, Unit 2	1,365	503	53	20	492	185	1,910	708
Quad Cities Nuclear Power Station, Unit 1	5,087	902	249	43	2,218	383	7,554	1,328
Quad Cities Nuclear Power Station, Unit 2	4,664	830	494	85	2,206	381	7,364	1,296
River Bend Station, Unit 1	4,152	738	225	41	3,324	604	7,701	1,383
R.E. Ginna Nuclear Power Plant	1,458	541	90	36	346	138	1,894	715
St. Lucie Plant, Unit 1	2,069	803	172	68	1,077	427	3,318	1,298
St. Lucie Plant, Unit 2	1,700	662	176	70	1,537	613	3,413	1,345
Salem Nuclear Generating Station, Unit 1	1,743	801	150	69	943	431	2,836	1,301
Salem Nuclear Generating Station, Unit 2	1,568	720	150	68	1,168	532	2,886	1,320
Seabrook Station, Unit 1	1,450	664	160	73	1,713	785	3,323	1,522
Sequoyah Nuclear Plant, Unit 1	1,638	749	168	76	1,285	585	3,091	1,410
Sequoyah Nuclear Plant, Unit 2	1,713	784	162	74	1,246	569	3,121	1,427

Table C-1 (continued)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Shearon Harris Nuclear Power Plant, Unit 1	1,250	566	136	62	1,313	596	2,699	1,224
South Texas Project, Unit 1	1,393	747	152	80	1,485	787	3,030	1,614
South Texas Project, Unit 2	1,301	697	154	82	1,656	882	3,111	1,661
Surry Nuclear Power Station, Unit 1	1,620	743	128	59	1,501	691	3,249	1,493
Surry Nuclear Power Station, Unit 2	1,659	761	132	60	1,543	703	3,334	1,524
Susquehanna Steam Electric Station, Unit 1	5,075	896	628	112	3,904	693	9,607	1,701
Susquehanna Steam Electric Station, Unit 2	5,001	883	311	55	4,496	798	9,808	1,736
Turkey Point Nuclear Generating, Unit 3	1,524	694	132	59	1,543	695	3,199	1,448
Turkey Point Nuclear Generating, Unit 4	1,548	705	136	61	1,585	715	3,269	1,481
Virgil C. Summer Nuclear Station, Unit 1	1,506	644	134	56	1,095	460	2,735	1,160
Vogtle Electric Generating Plant, Unit 1	1,805	780	182	77	1,740	739	3,727	1,596
Vogtle Electric Generating Plant, Unit 2	1,607	691	180	76	1,813	763	3,600	1,530
Waterford Steam Electric Station, Unit 3	1,958	825	198	85	1,801	776	3,957	1,686

Table C-1 (continued)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Watts Bar Nuclear Plant, Unit 1	1,145	527	172	79	2,171	998	3,488	1,604
Wolf Creek Generating Station, Unit 1	1,682	773	164	75	1,095	499	2,941	1,347
Watts Bar Nuclear Plant, Unit 2	72	33	144	67	2,785	1,291	3,001	1,391
Totals**	**239,713**	**69,041**	**21,236**	**6,252**	**174,718**	**51,336**	**435,667**	**126,629**

*Note: This table **does not** reflect SNF transfers.

Table C-2. No Replacement Nuclear Generation SNF Discharges by Reactor (Group A Sites Shutdown before 2000)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Big Rock Point	526	69.40	-	-	-	-	526	69.40
Haddam Neck	1,102	448.42	-	-	-	-	1,102	448.42
Humboldt Bay	390	28.94	-	-	-	-	390	28.94
La Crosse	334	38.09	-	-	-	-	334	38.09
Maine Yankee	1,434	542.26	-	-	-	-	1,434	542.26
Rancho Seco	493	228.38	-	-	-	-	493	228.38
Trojan	790	359.26	-	-	-	-	790	359.26
Yankee Rowe	533	127.13	-	-	-	-	533	127.13
Zion 1	1,143	523.94	-	-	-	-	1,143	523.94
Zion 2	1,083	495.47	-	-	-	-	1,083	495.47
Totals	**7,828**	**2,861.28**	**-**	**-**	**-**	**-**	**7,828**	**2,861.28**

*Note: This table **does not** reflect SNF transfers.

Table C-3. No Replacement Nuclear Generation SNF Discharges by Reactor (Shutdown Reactors at Group B Sites)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Dresden 1	892	90.87	-	-	-	-	892	90.87
Indian Point 1	160	30.58	-	-	-	-	160	30.58
Indian Point 2	1,698	770.51	284	128.62	-	-	1,982	899.14
Millstone 1	2,884	525.62	-	-	-	-	2,884	525.62
Totals	**5,634**	**1,417.59**	**284**	**128.62**	**0**	**0.00**	**5,918**	**1,546.21**

*Note: This table **does not** reflect SNF transfers.

Table C-4. No Replacement Nuclear Generation SNF Discharges by Reactor Site (Group A Sites Shutdown Post 2000)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Vermont Yankee	3,879	705.93	-	-	-	-	3,879	705.93
Crystal River 3	1,243	582.23	-	-	-	-	1,243	582.23
Kewaunee	1,335	518.70	-	-	-	-	1,335	518.70
Fort Calhoun	1,264	465.98	-	-	-	-	1,264	465.98
Oyster Creek Nuclear Generating Station	3,944	701.04	560	96.23	-	-	4,504	797.27
Pilgrim Nuclear Power Station	3,533	629.65	580	101.32	-	-	4,113	730.97
San Onofre 1	665	244.61	-	-	-	-	665	244.61
San Onofre 2	1,726	729.99	-	-	-	-	1,726	729.99
San Onofre 3	1,734	733.16	-	-	-	-	1,734	733.16
Duane Arnold	3,128	566.31	520	93.58	-	-	3,648	659.89
Three Mile Island 1	1,486	700.32	177	85.29	-	-	1,663	785.60
Totals	**23,937**	**6,577.92**	**1,837**	**376.42**	**-**	**-**	**25,774**	**6,954.34**

*Note: This table **does not** reflect SNF transfers.

Table C-5. No Replacement Nuclear Generation SNF Discharges by Reactor Site (Totals)

	SNF Discharges as of 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/20120		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF	
Reactor [Unit]	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**	**Assy.**	**Initial Uranium (MT)**
Operating Reactors	239,713	69,041	21,236	6,252	174,718	51,336	435,667	126,629
Group A Pre-2000	7,828	2,861	0	0	0	0	7,828	2,861
Shutdown Group B	5,634	1,418	284	129	0	0	5,918	1,546
Group A Post-2000	23,937	6,578	1,837	376	0	0	25,774	6,954
Grand Total	**277,112**	**79,898**	**23,357**	**6,757**	**174,718**	**51,336**	**475,187**	**137,991**

*Note: This table **does not** reflect SNF transfers.

Appendix D

Reference Scenario: No Replacement Nuclear Generation Forecast – Discharged SNF by State

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Table D-1. Estimated and Projected Inventory at NPR Sites and Morris Site by State

State	SNF Discharged Prior to 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF		Past Inter-State Transfer Adjustments		State's Forecasted Remaining Inventory	
	Assy.	Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Alabama	15,901	3,734	1,709	369	9,941	2,235	27,551	6,338	0	0	27,551	6,338
Arizona	5,825	2,503	640	280	6,168	2,702	12,633	5,485	0	0	12,633	5,485
Arkansas	3,476	1,535	292	133	1,844	837	5,612	2,505	0	0	5,612	2,505
California	8,296	3,380	374	158	854	361	9,524	3,900	-270	-98	9,254	3,801
Connecticut	7,165	2,323	318	137	2,436	1,059	9,919	3,518	-83	-35	9,836	3,484
Florida	8,084	3,446	616	259	5,742	2,449	14,442	6,154	-18	-8	14,424	6,146
Georgia	12,636	3,133	1,040	275	8,051	2,309	21,727	5,716	0	0	21,727	5,716
Illinois	42,348	9,762	3,428	777	26,197	6,288	71,973	16,826	2,461	529	74,434	17,355
Iowa	3,128	566	520	94	0	0	3,648	660	0	0	3,648	660
Kansas	1,682	773	164	75	1,095	499	2,941	1,347	0	0	2,941	1,347
Louisiana	6,110	1,563	423	126	5,125	1,380	11,658	3,068	0	0	11,658	3,068
Maine	1,434	542	0	0	0	0	1,434	542	0	0	1,434	542
Maryland	3,739	1,465	293	119	1,798	731	5,830	2,315	-2	-1	5,828	2,314
Massachusetts	4,066	757	580	101	0	0	4,646	858	0	0	4,646	858
Michigan	9,731	3,121	842	270	6,106	1,691	16,679	5,082	-85	-11	16,594	5,070
Minnesota	6,284	1,627	312	86	2,184	567	8,780	2,279	-1,058	-198	7,722	2,081
Mississippi	5,452	969	648	118	4,688	854	10,788	1,941	0	0	10,788	1,941
Missouri	1,998	846	174	73	1,498	625	3,670	1,544	0	0	3,670	1,544
Nebraska	5,228	1,188	330	59	1,538	277	7,096	1,525	-1,056	-198	6,040	1,327
New Hampshire	1,450	664	160	73	1,713	785	3,323	1,522	0	0	3,323	1,522
New Jersey	11,743	3,028	1,298	312	6,598	1,769	19,639	5,109	0	0	19,639	5,109

Table D-1 (continued)

State	SNF Discharged Prior to 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF		Past Inter-State Transfer Adjustments		State's Forecasted Remaining Inventory	
	Assy.	Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
New York	16,732	4,174	1,439	380	8,124	1,577	26,295	6,130	-40	-15	26,255	6,115
North Carolina	13,080	3,652	1,129	320	8,025	2,452	22,234	6,424	1,108	491	23,342	6,915
Ohio	5,617	1,387	435	126	5,194	1,175	11,246	2,688	0	0	11,246	2,688
Oregon	790	359	0	0	0	0	790	359	0	0	790	359
Pennsylvania	34,191	7,302	3,055	672	29,780	5,923	67,026	13,898	-2	0	67,024	13,897
South Carolina	11,670	5,273	860	393	6,003	2,721	18,533	8,388	-1,109	-495	17,425	7,896
Tennessee	4,568	2,094	646	296	7,487	3,442	12,701	5,832	0	0	12,701	5,832
Texas	5,783	2,745	674	318	7,207	3,381	13,664	6,444	0	0	13,664	6,444
Vermont	3,879	706	0	0	0	0	3,879	706	0	0	3,879	706
Virginia	6,455	2,976	522	241	4,930	2,270	11,907	5,487	-69	-31	11,838	5,455
Washington	4,344	767	248	44	3,492	622	8,084	1,433	0	0	8,084	1,433
Wisconsin	4,227	1,538	188	74	900	355	5,315	1,967	-10	-4	5,305	1,963
Totals	**277,112**	**79,898**	**23,357**	**6,757**	**174,718**	**51,336**	**475,187**	**137,991**	**-233**	**-73**	**474,954**	**137,918**

* Total Interstate Transfer reflects the amount of SNF reported in GC-859 as being transferred to DOE, this is not the total quantity of NPR SNF in DOE possession, see Section 3.1.2..

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table D-2. Estimated Inventory at NPR Sites and Morris Site by State and by Storage Configuration at the end of 2020

State	Dry Inventory			Pool Inventory		Site Inventory	
	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Alabama	8,405	1,952	139	9,205	2,151	17,610	4,103
Arizona	3,907	1,682	159	2,558	1,101	6,465	2,784
Arkansas	2,576	1,140	96	1,192	528	3,768	1,668
California	6,594	2,664	207	1,806	776	8,400	3,440
Connecticut	2,331	971	81	5,069	1,454	7,400	2,424
Florida	3,451	1,501	108	5,231	2,196	8,682	3,697
Georgia	7,092	1,606	126	6,584	1,802	13,676	3,407
Illinois	18,293	4,409	332	29,944	6,659	48,237	11,067
Iowa	1,830	331	30	1,818	329	3,648	660
Kansas	-	-	-	1,846	847	1,846	847
Louisiana	3,100	794	62	3,433	895	6,533	1,689
Maine	1,434	542	60	-	-	1,434	542
Maryland	2,624	1,031	94	1,406	552	4,030	1,583
Massachusetts	2,437	466	43	2,209	393	4,646	858
Michigan	4,768	1,510	123	5,720	1,870	10,488	3,380
Minnesota	3,710	1,012	77	1,828	503	5,538	1,515
Mississippi	2,448	436	36	3,652	651	6,100	1,087
Missouri	666	282	18	1,506	637	2,172	919
Nebraska	3,094	796	70	1,408	254	4,502	1,050
New Hampshire	704	322	22	906	415	1,610	737
New Jersey	5,506	1,297	103	7,535	2,043	13,041	3,340
New York	6,728	1,708	138	11,403	2,830	18,131	4,538
North Carolina	4,516	1,386	106	10,801	3,078	15,317	4,464
Ohio	2,196	543	40	3,856	970	6,052	1,513
Oregon	790	359	34	-	-	790	359
Pennsylvania	17,534	3,276	285	19,710	4,698	37,244	7,974
South Carolina	6,365	2,912	253	5,057	2,262	11,422	5,175
Tennessee	2,703	1,238	79	2,511	1,152	5,214	2,390
Texas	1,788	804	54	4,669	2,259	6,457	3,062
Vermont	3,879	706	58	-	-	3,879	706
Virginia	4,926	2,270	163	1,982	915	6,908	3,185
Washington	3,060	540	45	1,532	271	4,592	811
Wisconsin	3,140	1,122	93	1,265	486	4,405	1,608
Totals	**142,595**	**41,608**	**3,334**	**157,641**	**44,976**	**300,236**	**86,584**

Excludes SNF from TMI Unit 2 (in ID) and Fort St. Vrain (in ID and CO).
SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table D-3. Estimated Pool Inventory by Current Group and by State at the end of 2020

State	A		B		C		F		Totals	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Alabama	-	-	-	-	9,205	2,151	-	-	9,205	2,151
Arizona	-	-	-	-	2,558	1,101	-	-	2,558	1,101
Arkansas	-	-	-	-	1,192	528	-	-	1,192	528
California	-	-	-	-	1,806	776	-	-	1,806	776
Connecticut	-	-	5,069	1,454	-	-	-	-	5,069	1,454
Florida	-	-	-	-	5,231	2,196	-	-	5,231	2,196
Georgia	-	-	-	-	6,584	1,802	-	-	6,584	1,802
Illinois	-	-	5,539	929	21,188	5,056	3,217	674	29,944	6,659
Iowa	1,818	329	-	-	-	-	-	-	1,818	329
Kansas	-	-	-	-	1,846	847	-	-	1,846	847
Louisiana	-	-	-	-	3,433	895	-	-	3,433	895
Maryland	-	-	-	-	1,406	552	-	-	1,406	552
Massachusetts	2,209	393	-	-	-	-	-	-	2,209	393
Michigan	-	-	-	-	5,720	1,870	-	-	5,720	1,870
Minnesota	-	-	-	-	1,828	503	-	-	1,828	503
Mississippi	-	-	-	-	3,652	651	-	-	3,652	651
Missouri	-	-	-	-	1,506	637	-	-	1,506	637
Nebraska	-	-	-	-	1,408	254	-	-	1,408	254
New Hampshire	-	-	-	-	906	415	-	-	906	415
New Jersey	2,430	430	-	-	5,105	1,613	-	-	7,535	2,043
New York	-	-	2,140	972	9,263	1,858	-	-	11,403	2,830
North Carolina	-	-	-	-	10,801	3,078	-	-	10,801	3,078
Ohio	-	-	-	-	3,856	970	-	-	3,856	970

Table D-3 (continued)

State	A		B		C		F		Totals	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Pennsylvania	1,663	786	-	-	18,047	3,912	-	-	19,710	4,698
South Carolina	-	-	-	-	5,056	2,262	-	-	5,056	2,262
Tennessee	-	-	-	-	2,511	1,152	-	-	2,511	1,152
Texas	-	-	-	-	4,669	2,259	-	-	4,669	2,259
Virginia	-	-	-	-	1,982	915	-	-	1,982	915
Washington	-	-	-	-	1,532	271	-	-	1,532	271
Wisconsin	-	-	-	-	1,265	486	-	-	1,265	486
Totals	**8,120**	**1,938**	**12,748**	**3,355**	**133,556**	**39,009**	**3,217**	**674**	**157,641**	**44,976**

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table D-4. Estimated Dry Inventory by Current Group and by State at the end of 2020

State	A			B			C			Totals		
	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks
Alabama	-	-	-	-	-	-	8,405	1,952	139	8,405	1,952	139
Arizona	-	-	-	-	-	-	3,907	1,682	159	3,907	1,682	159
Arkansas	-	-	-	-	-	-	2,576	1,140	96	2,576	1,140	96
California	4,738	1,867	149	-	-	-	1,856	797	58	6,594	2,664	207
Connecticut	1,019	414	40	1,312	557	41	-	-	-	2,331	971	81
Florida	1,243	582	39	-	-	-	2,208	919	69	3,451	1,501	108
Georgia	-	-	-	-	-	-	7,092	1,606	126	7,092	1,606	126
Illinois	2,226	1,019	61	5,780	997	85	10,287	2,393	186	18,293	4,409	332
Iowa	1,830	331	30	-	-	-	-	-	-	1,830	331	30
Louisiana	-	-	-	-	-	-	3,100	794	62	3,100	794	62
Maine	1,434	542	60	-	-	-	-	-	-	1,434	542	60
Maryland	-	-	-	-	-	-	2,624	1,031	94	2,624	1,031	94
Massachusetts	2,437	466	43	-	-	-	-	-	-	2,437	466	43
Michigan	441	58	7	-	-	-	4,327	1,452	116	4,768	1,510	123
Minnesota	-	-	-	-	-	-	3,710	1,012	77	3,710	1,012	77
Mississippi	-	-	-	-	-	-	2,448	436	36	2,448	436	36
Missouri	-	-	-	-	-	-	666	282	18	666	282	18
Nebraska	1,264	466	40	-	-	-	1,830	330	30	3,094	796	70
New Hampshire	-	-	-	-	-	-	704	322	22	704	322	22
New Jersey	2,074	367	34	-	-	-	3,432	930	69	5,506	1,297	103
New York	-	-	-	1,664	714	52	5,064	994	86	6,728	1,708	138
North Carolina	-	-	-	-	-	-	4,516	1,386	106	4,516	1,386	106
Ohio	-	-	-	-	-	-	2,196	543	40	2,196	543	40

Table D-4 (continued)

State	A			B			C			Totals		
	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks
Oregon	790	359	34	-	-	-	-	-	-	790	359	34
Pennsylvania	-	-	-	-	-	-	17,534	3,276	285	17,534	3,276	285
South Carolina	-	-	-	-	-	-	6,365	2,912	253	6,365	2,912	253
Tennessee	-	-	-	-	-	-	2,703	1,238	79	2,703	1,238	79
Texas	-	-	-	-	-	-	1,788	804	54	1,788	804	54
Vermont	3,879	706	58	-	-	-	-	-	-	3,879	706	58
Virginia	-	-	-	-	-	-	4,926	2,270	163	4,926	2,270	163
Washington	-	-	-	-	-	-	3,060	540	45	3,060	540	45
Wisconsin	1,668	557	43	-	-	-	1,472	565	50	3,140	1,122	93
Totals	**25,043**	**7,734**	**638**	**8,756**	**2,268**	**178**	**108,796**	**31,606**	**2,518**	**142,595**	**41,608**	**3,334**

Excludes SNF from TMI Unit 2 (in ID) and Fort St. Vrain (in ID and CO).

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table D-5. Estimated Total Inventory of Group A Sites by State at the end of 2020

State	A1		A2		A3		A	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
California	4,738	1,867	-	-	-	-	4,738	1,867
Connecticut	1,019	414	-	-	-	-	1,019	414
Florida	1,243	582	-	-	-	-	1,243	582
Illinois	2,226	1,019	-	-	-	-	2,226	1,019
Iowa	-	-	3,648	660	-	-	3,648	660
Maine	1,434	542	-	-	-	-	1,434	542
Massachusetts	533	127	4,113	731	-	-	4,646	858
Michigan	441	58	-	-	-	-	441	58
Nebraska	1,264	466	-	-	-	-	1,264	466
New Jersey	-	-	4,504	797	-	-	4,504	797
Oregon	790	359	-	-	-	-	790	359
Pennsylvania	-	-	-	-	1,663	786	1,663	786
Vermont	3,879	706	-	-	-	-	3,879	706
Wisconsin	1,668	557	-	-	-	-	1,668	557
Totals	**19,235**	**6,697**	**12,265**	**2,188**	**1,663**	**786**	**33,163**	**9,672**

Excludes SNF from Fort St. Vrain at DOE-Managed ISFSI in Colorado.

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table D-6. Estimated Total Inventory of Group B Sites by State at the end of 2020

State	B2		B3		B	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Connecticut	6,381	2,011	-	-	6,381	2,011
Illinois	11,319	1,925	-	-	11,319	1,925
New York	3,804	1,687	-	-	3,804	1,687
Totals	**21,504**	**5,623**	-	-	**21,504**	**5,623**

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table D-7. Estimated Total Inventory of Group C Sites by State at the end of 2020

State	C2		C3		C	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Alabama	17,610	4,103	-	-	17,610	4,103
Arizona	6,465	2,784	-	-	6,465	2,784
Arkansas	3,768	1,668	-	-	3,768	1,668
California	3,662	1,573	-	-	3,662	1,573
Florida	7,439	3,115	-	-	7,439	3,115
Georgia	13,676	3,407	-	-	13,676	3,407
Illinois	31,475	7,448	-	-	31,475	7,448
Kansas	-	-	1,846	847	1,846	847
Louisiana	6,533	1,689	-	-	6,533	1,689
Maryland	4,030	1,583	-	-	4,030	1,583
Michigan	10,047	3,322	-	-	10,047	3,322
Minnesota	5,538	1,515	-	-	5,538	1,515
Mississippi	6,100	1,087	-	-	6,100	1,087
Missouri	2,172	919	-	-	2,172	919
Nebraska	3,238	584	-	-	3,238	584
New Hampshire	1,610	737	-	-	1,610	737
New Jersey	8,537	2,543	-	-	8,537	2,543
New York	14,327	2,852	-	-	14,327	2,852
North Carolina	9,036	2,832	6,281	1,631	15,317	4,464
Ohio	6,052	1,513	-	-	6,052	1,513
Pennsylvania	35,581	7,188	-	-	35,581	7,188
South Carolina	11,421	5,174	-	-	11,421	5,174
Tennessee	5,214	2,390	-	-	5,214	2,390
Texas	6,457	3,062	-	-	6,457	3,062
Virginia	6,908	3,185	-	-	6,908	3,185
Washington	4,592	811	-	-	4,592	811
Wisconsin	2,737	1,051	-	-	2,737	1,051
Totals	**234,225**	**68,136**	**8,127**	**2,479**	**242,352**	**70,615**

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table D-8. Estimated Total Inventory of Group F Site by State at the end of 2020

State	F	
	Assy.	Estimated Initial Uranium (MT)
Illinois	3,217	674
Totals	**3,217**	**674**

Table D-9. Estimated Total Inventory by Current Group and by State at the end of 2020

State	A		B		C		F		Totals	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Alabama	-	-	-	-	17,610	4,103	-	-	17,610	4,103
Arizona	-	-	-	-	6,465	2,784	-	-	6,465	2,784
Arkansas	-	-	-	-	3,768	1,668	-	-	3,768	1,668
California	4,738	1,867	-	-	3,662	1,573	-	-	8,400	3,440
Connecticut	1,019	414	6,381	2,011	-	-	-	-	7,400	2,424
Florida	1,243	582	-	-	7,439	3,115	-	-	8,682	3,697
Georgia	-	-	-	-	13,676	3,407	-	-	13,676	3,407
Illinois	2,226	1,019	11,319	1,925	31,475	7,448	3,217	674	48,237	11,067
Iowa	3,648	660	-	-	-	-	-	-	3,648	660
Kansas	-	-	-	-	1,846	847	-	-	1,846	847
Louisiana	-	-	-	-	6,533	1,689	-	-	6,533	1,689
Maine	1,434	542	-	-	-	-	-	-	1,434	542
Maryland	-	-	-	-	4,030	1,583	-	-	4,030	1,583
Massachusetts	4,646	858	-	-	-	-	-	-	4,646	858

Table D-9 (continued)

State	A		B		C		F		Totals	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Michigan	441	58	-	-	10,047	3,322	-	-	10,488	3,380
Minnesota	-	-	-	-	5,538	1,515	-	-	5,538	1,515
Mississippi	-	-	-	-	6,100	1,087	-	-	6,100	1,087
Missouri	-	-	-	-	2,172	919	-	-	2,172	919
Nebraska	1,264	466	-	-	3,238	584	-	-	4,502	1,050
New Hampshire	-	-	-	-	1,610	737	-	-	1,610	737
New Jersey	4,504	797	-	-	8,537	2,543	-	-	13,041	3,340
New York	-	-	3,804	1,687	14,327	2,852	-	-	18,131	4,538
North Carolina	-	-	-	-	15,317	4,464	-	-	15,317	4,464
Ohio	-	-	-	-	6,052	1,513	-	-	6,052	1,513
Oregon	790	359	-	-	-	-	-	-	790	359
Pennsylvania	1,663	786	-	-	35,581	7,188	-	-	37,244	7,974
South Carolina	-	-	-	-	11,421	5,174	-	-	11,421	5,174
Tennessee	-	-	-	-	5,214	2,390	-	-	5,214	2,390
Texas	-	-	-	-	6,457	3,062	-	-	6,457	3,062
Vermont	3,879	706	-	-	-	-	-	-	3,879	706
Virginia	-	-	-	-	6,908	3,185	-	-	6,908	3,185
Washington	-	-	-	-	4,592	811	-	-	4,592	811
Wisconsin	1,668	557	-	-	2,737	1,051	-	-	4,405	1,608
Totals	**33,163**	**9,672**	**21,504**	**5,623**	**242,352**	**70,615**	**3,217**	**674**	**300,236**	**86,584**

Excludes SNF from TMI Unit 2 (in ID) and Fort St. Vrain (in ID and CO).

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table D-10. Projected Inventory by Current Group and by State through 2075

State	A		B		C		F		Totals	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Alabama	-	-	-	-	27,551	6,338	-	-	27,551	6,338
Arizona	-	-	-	-	12,633	5,485	-	-	12,633	5,485
Arkansas	-	-	-	-	5,612	2,505	-	-	5,612	2,505
California	4,738	1,867	-	-	4,516	1,935	-	-	9,254	3,801
Connecticut	1,019	414	8,817	3,070	-	-	-	-	9,836	3,484
Florida	1,243	582	-	-	13,181	5,564	-	-	14,424	6,146
Georgia	-	-	-	-	21,727	5,716	-	-	21,727	5,716
Illinois	2,226	1,019	14,755	2,519	54,236	13,142	3,217	674	74,434	17,355
Iowa	3,648	660	-	-	-	-	-	-	3,648	660
Kansas	-	-	-	-	2,941	1,347	-	-	2,941	1,347
Louisiana	-	-	-	-	11,658	3,068	-	-	11,658	3,068
Maine	1,434	542	-	-	-	-	-	-	1,434	542
Maryland	-	-	-	-	5,828	2,314	-	-	5,828	2,314
Massachusetts	4,646	858	-	-	-	-	-	-	4,646	858
Michigan	441	58	-	-	16,153	5,012	-	-	16,594	5,070
Minnesota	-	-	-	-	7,722	2,081	-	-	7,722	2,081
Mississippi	-	-	-	-	10,788	1,941	-	-	10,788	1,941
Missouri	-	-	-	-	3,670	1,544	-	-	3,670	1,544
Nebraska	1,264	466	-	-	4,776	861	-	-	6,040	1,327
New Hampshire	-	-	-	-	3,323	1,522	-	-	3,323	1,522
New Jersey	4,504	797	-	-	15,135	4,312	-	-	19,639	5,109
New York	-	-	3,997	1,774	22,258	4,341	-	-	26,255	6,115
North Carolina	-	-	-	-	23,342	6,915	-	-	23,342	6,915

Table D-10 (continued)

State	A		B		C		F		Totals	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
Ohio	-	-	-	-	11,246	2,688	-	-	11,246	2,688
Oregon	790	359	-	-	-	-	-	-	790	359
Pennsylvania	1,663	786	-	-	65,361	13,112	-	-	67,024	13,897
South Carolina	-	-	-	-	17,424	7,896	-	-	17,424	7,896
Tennessee	-	-	-	-	12,701	5,832	-	-	12,701	5,832
Texas	-	-	-	-	13,664	6,444	-	-	13,664	6,444
Vermont	3,879	706	-	-	-	-	-	-	3,879	706
Virginia	-	-	-	-	11,838	5,455	-	-	11,838	5,455
Washington	-	-	-	-	8,084	1,433	-	-	8,084	1,433
Wisconsin	1,668	557	-	-	3,637	1,406	-	-	5,305	1,963
Totals	**33,163**	**9,672**	**27,569**	**7,363**	**411,005**	**120,210**	**3,217**	**674**	**474,954**	**137,918**

Excludes SNF from TMI Unit 2 (in ID) and Fort St. Vrain (in ID and CO).

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

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Appendix E

Reference Scenario: No Replacement Nuclear Generation Forecast – Discharged SNF by NRC Region

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Table E-1. Estimated and Projected Inventory by NRC Region

NRC Region	SNF Discharged Prior to 12/31/2017		Forecast Discharges 1/1/2018 to 12/31/2020		Forecast Future Discharges 1/1/2021 to 12/31/2075		Total Projected Discharged SNF		Past Inter-Region Transfer Adjustments		Region's Forecasted Remaining Inventory	
	Assy.	Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
1	84,399	20,961	7,143	1,794	50,449	11,844	141,991	34,599	-127	-51	141,864	34,548
2	75,986	24,958	6,842	2,211	53,523	18,486	136,351	45,654	-88	-40	136,263	45,614
3	67,743	17,351	5,405	1,367	37,237	9,468	110,385	28,187	1,308	315	111,693	28,502
4	48,984	16,628	3,967	1,384	33,509	11,539	86,460	29,551	-1,326	-297	85,134	29,254
Totals*	**277,112**	**79,898**	**23,357**	**6,757**	**174,718**	**51,336**	**475,187**	**137,991**	**-233**	**-73**	**474,954**	**137,918**

* Total Interstate Transfer reflects the amount of SNF reported in GC-859 as being transferred to DOE, this is not the total quantity of NPR SNF in DOE possession, see Section 3.1.2..

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table E-2. Estimated Inventory by NRC Region and by Storage Configuration at the end of 2020

	Dry Inventory			Pool Inventory		Site Inventory	
NRC Region	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
1	43,177	10,319	884	48,238	12,385	91,415	22,704
2	38,437	13,042	985	44,303	14,087	82,740	27,128
3	32,958	8,749	684	41,498	10,285	74,456	19,034
4	28,023	9,497	781	23,602	8,218	51,625	17,716
Totals	**142,595**	**41,608**	**3,334**	**157,641**	**44,976**	**300,236**	**86,584**

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table E-3. Estimated Pool Inventory by Current Group and by NRC Region at the end of 2020

NRC Region	A		B		C		F		Totals	
	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
1	6,302	1,608	7,209	2,426	34,727	8,350	0	0	48,238	12,385
2	0	0	0	0	44,303	14,087	0	0	44,303	14,087
3	1,818	329	5,539	929	30,924	8,353	3,217	674	41,498	10,285
4	0	0	0	0	23,602	8,218	0	0	23,602	8,218
Totals	**8,120**	**1,938**	**12,748**	**3,355**	**133,556**	**39,009**	**3,217**	**674**	**157,641**	**44,976**

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table E-4. Estimated Dry Inventory by Current Group and by NRC Region at the end of 2020

NRC Region	A			B			C			Totals		
	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks	Assy.	Estimated Initial Uranium (MT)	SNF Casks
1	10,843	2,494	235	2,976	1,271	93	29,358	6,553	556	43,177	10,319	884
2	1,243	582	39	0	0	0	37,194	12,460	946	38,437	13,042	985
3	6,165	1,965	141	5,780	997	85	21,013	5,788	458	32,958	8,749	684
4	6,792	2,692	223	0	0	0	21,231	6,805	558	28,023	9,497	781
Totals	**25,043**	**7,734**	**638**	**8,756**	**2,268**	**178**	**108,796**	**31,606**	**2,518**	**142,595**	**41,608**	**3,334**

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table E-5. Estimated Total Inventory by Current Group and by NRC Region at the end of 2020

	A		B		C		F		Totals	
NRC Region	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
1	17,145	4,103	10,185	3,697	64,085	14,904	-	-	91,415	22,704
2	1,243	582	-	-	81,497	26,546	-	-	82,740	27,128
3	7,983	2,294	11,319	1,925	51,937	14,141	3,217	674	74,456	19,034
4	6,792	2,692	-	-	44,833	15,024	-	-	51,625	17,716
Totals	**33,163**	**9,672**	**21,504**	**5,623**	**242,352**	**70,615**	**3,217**	**674**	**300,236**	**86,584**

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Table E-6. Projected Inventory by Current Group and by NRC Region through 2075

	A		B		C		F		Totals	
NRC Region	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)	Assy.	Estimated Initial Uranium (MT)
1	17,145	4,103	12,814	4,844	111,905	25,601	0	0	141,864	34,548
2	1,243	582	0	0	135,020	45,032	0	0	136,263	45,614
3	7,983	2,294	14,755	2,519	85,738	23,015	3,217	674	111,693	28,502
4	6,792	2,692	0	0	78,342	26,562	0	0	85,134	29,254
Totals*	**33,163**	**9,671**	**27,569**	**7,363**	**411,005**	**120,210**	**3,217**	**674**	**474,954**	**137,918**

SNF mass in MT has been rounded to the nearest MT, totals are rounded sums of pre-rounded quantities.

Appendix F

Reference Scenario: No Replacement Nuclear Generation Forecast – Inventory by Congressional District

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Table F-1 Estimated Inventory by State and Congressional District as of December 31, 2020

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
Alabama (AL)	2	Martha Roby (R)	Richard Shelby (R)	Joseph M. Farley Nuclear Plant	Comm Reactor	1,578	-	-	1,578
Alabama (AL)	5	Mo Brooks (R)	Tommy Tuberville (R)	Browns Ferry Nuclear Plant	Comm Reactor	2,525	-	-	2,525
Arizona (AZ)	3	Raul Grijalva (D)	Mark Kelly (D) Kyrsten Sinema (D)	Palo Verde Nuclear Generating Station	Comm Reactor	2,784	-	-	2,784
Arkansas (AR)	3	Steve Womack (R)	John Boozman (R) Tom Cotton (R)	Arkansas Nuclear One	Comm Reactor	1,668	-	-	1,668
California (CA)	2	Jared Huffman (D)	Dianne Feinstein (D) Alex Padilla (D)	**Humboldt Bay**	Comm Reactor	29	-	-	29
California (CA)	6	Doris O. Matsui (D)		UC Davis/McClellan Nuclear Research Center	University Reactor	-	-	-	a
California (CA)	7	Ami Bera (D)		**Rancho Seco**	Comm Reactor	228	-	-	228
California (CA)	13	Barbara Lee (D)		Lawrence Berkeley National Laboratory	DOE National Lab	-	-	-	b
California (CA)	15	Eric Swalwell (D)		Aerotest Research ARRR	Non DOE Res Reactor	-	-	-	a
California (CA)	15	Eric Swalwell (D)		General Electric NTR	Non DOE Res Reactor	-	-	-	a
California (CA)	15	Eric Swalwell (D)		Lawrence Livermore National Laboratory	DOE National Lab	-	-	-	b
California (CA)	18	Anna G. Eshoo (D)		SLAC National Accelerator Laboratory	DOE National Lab	-	-	-	b
California (CA)	24	Salud Carbajal (D)		Diablo Canyon Nuclear Power Plant	Comm Reactor	1,573	-	-	1,573
California (CA)	45	Katie Porter (D)		University of California Irvine	University Reactor	-	-	-	a
California (CA)	49	Mike Levin (D)		**San Onofre**	Comm Reactor	1,609	-	-	1,609

Table F-1 (continued)

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
Colorado (CO)	4	Ken Buck (R)	Michael Bennet (D)	Fort St. Vrain	DOE Site	-	15	-	15
Colorado (CO)	7	Ed Perlmutter (D)	John Hickenlooper (D)	National Renewable Energy Laboratory	DOE National Lab	-	-	-	b
Colorado (CO)	7	Ed Perlmutter (D)		U.S. Geological Survey GSTR	Non DOE Res Reactor	-	-	-	a
Connecticut (CT)	2	Joe Courtney (D)	Richard Blumenthal (D)	**Haddam Neck**	Comm Reactor	414	-	-	414
Connecticut (CT)	2	Joe Courtney (D)	Chris Murphy (D)	Millstone Power Station	Comm Reactor	2,011	-	-	2,011
Florida (FL)	3	Kat Cammack (R)	Rick Scott (R)	University of Florida UFTR	University Reactor	-	-	-	a
Florida (FL)	11	Daniel Webster (R)	Marco Rubio (R)	**Crystal River**	Comm Reactor	582	-	-	582
Florida (FL)	18	Brian Mast (R)		St. Lucie Plant	Comm Reactor	1,603	-	-	1,603
Florida (FL)	27	Maria Salazar (R)		Turkey Point Nuclear Generating	Comm Reactor	1,511	-	-	1,511
Georgia (GA)	1	Buddy Carter (R)	Raphael Warnock (D)	Edwin I. Hatch Nuclear Plant	Comm Reactor	1,783	-	-	1,783
Georgia (GA)	12	Rick Allen (R)	Jon Ossoff (D)	Vogtle Electric Generating Plant	Comm Reactor	1,624	-	-	1,624
Idaho (ID)	2	Mike Simpson (R)	Mike Crapo (R)	Idaho National Laboratory	DOE National Lab w/ Reactor	-	270	1,900	2,170
Idaho (ID)	2	Mike Simpson (R)	James Risch (R)	Idaho State University AGN-201	University Reactor	-	-	-	a
Idaho (ID)	2	Mike Simpson (R)		Naval Reactors Storage Facility	DOE National Lab	-	38	-	37

Table F-1 (continued)

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
Illinois (IL)	3	Daniel Lipinski (D)	Richard Durbin (D)	Argonne National Laboratory	DOE National Lab	-	-	-	b
Illinois (IL)	10	Bradley Schneider (D)	Tammy Duckworth (D)	**Zion**	Comm Reactor	1,019	-	-	1,019
Illinois (IL)	13	Rodney Davis (R)		Clinton Power Station	Comm Reactor	708	-	-	708
Illinois (IL)	14	Lauren Underwood (D)		Fermi National Accelerator National Laboratory	DOE National Lab	-	-	-	b
Illinois (IL)	16	Adam Kinzinger (R)		Braidwood Station	Comm Reactor	1,525	-	-	1,525
Illinois (IL)	16	Adam Kinzinger (R)		Byron Station	Comm Reactor	1,650	-	-	1,650
Illinois (IL)	16	Adam Kinzinger (R)		Dresden Nuclear Power Station	Comm Reactor	1,926	-	-	1,925
Illinois (IL)	16	Adam Kinzinger (R)		GE Morris	Comm Reactor	674	-	-	674
Illinois (IL)	16	Adam Kinzinger (R)		LaSalle County Station	Comm Reactor	1,706	-	-	1,706
Illinois (IL)	17	Cheri Bustos (D)		Quad Cities Nuclear Power Station	Comm Reactor	1,860	-	-	1,860
Indiana (IN)	4	James Baird (R)	Todd Young (R) Mike Braun (R)	Purdue University PUR-1	University Reactor	-	-	-	a
Iowa (IA)	1	Abby Finkenauer (D)	Charles Grassley (R)	Duane Arnold Energy Center	Comm Reactor	660	-	-	660
Iowa (IA)	4	Randy Feenstra (R)	Joni Ernst (R)	Ames Laboratory (DOE Site)	DOE National Lab	-	-	-	b
Kansas (KS)	1	Tracy Mann (R)	Roger Marshall (R)	Kansas State University TRIGA II	University Reactor	-	-	-	**a**
Kansas (KS)	2	Steve Watkins (R)	Jerry Moran (R)	Wolf Creek Generating Station	Comm Reactor	847	-	-	847

Table F-1 (continued)

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
Louisiana (LA)	2	Cedric Richmond (D)	John Kennedy (R)	Waterford Steam Electric Station	Comm Reactor	910	-	-	910
Louisiana (LA)	5	Ralph Abraham (R)	Bill Cassidy (R)	River Bend Station	Comm Reactor	779	-	-	779
Maine (ME)	1	Chellie Pingree (D)	Susan Collins (R) Angus King (I)	**Maine Yankee**	Comm Reactor	542	-	-	542
Maryland (MD)	5	Steny H. Hoyer (D)	Chris Van Hollen (D)	Calvert Cliffs Nuclear Power Plant	Comm Reactor	1,583	-	-	1,583
Maryland (MD)	5	Steny H. Hoyer (D)	Ben Cardin (D)	University of Maryland MUTR	University Reactor	-	-	-	a
Maryland (MD)	6	David Trone (D)		National Institute of Standards and Technology	Non DOE Res Reactor	-	-	-	a
Maryland (MD)	8	Jamie Raskin (D)		Armed Forces Radiobiology Research Institute TRIGA	Non DOE Res Reactor	-	-	-	a
Massachusetts (MA)	1	Richard E. Neal (D)	Elizabeth Warren (D)	**Yankee-Rowe**	Comm Reactor	127	-	-	127
Massachusetts (MA)	3	Lori Trahan (D)	Ed Markey (D)	University of Lowell UMLRR	University Reactor	-	-	-	a
Massachusetts (MA)	7	Ayanna Pressley (D)		Massachusetts Institute of Technology MITR-II	University Reactor	-	-	-	a
Massachusetts (MA)	9	William Keating (D)		**Pilgrim Nuclear Power Station**	Comm Reactor	731	-	-	731
Michigan (MI)	1	Jack Bergman (R)	Debbie Stabenow (D)	**Big Rock Point**	Comm Reactor	58	-	-	58
Michigan (MI)	4	John Moolenaar (R)	Gary Peters (D)	DOW Chemical TRIGA	Non DOE Res Reactor	-	-	-	a
Michigan (MI)	6	Fred Upton (R)		Donald C. Cook Nuclear Power Plant	Comm Reactor	1,869	-	-	1,869
Michigan (MI)	6	Fred Upton (R)		Palisades Nuclear Plant	Comm Reactor	754	-	-	754
Michigan (MI)	12	Debbie Dingell (D)		Fermi	Comm Reactor	699	-	-	699

Table F-1 (continued)

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
Minnesota (MN)	2	Angie Craig (D)	Amy Klobuchar (D)	Prairie Island Nuclear Generating Plant	Comm Reactor	1,044	-	-	1,044
Minnesota (MN)	6	Tom Emmer (R)	Tina Smith (D)	Monticello Nuclear Generating Plant	Comm Reactor	471	-	-	471
Mississippi (MS)	2	Bennie G. Thompson (D)	Cindy Hyde-Smith (R) Roger Wicker (R)	Grand Gulf Nuclear Station	Comm Reactor	1,087	-	-	1,087
Missouri (MO)	3	Blaine Luetkemeyer (R)	Joshua Hawley (R)	Callaway Plant	Comm Reactor	919	-	-	919
Missouri (MO)	4	Vicky Hartzler (R)	Roy Blunt (R)	University of Missouri at Columbia	University Reactor	-	-	-	a
Missouri (MO)	8	Jason Smith (R)		Missouri University of Science and Technology	University Reactor	-	-	-	a
Nebraska (NE)	1	Jeff Fortenberry (R)	Deb Fischer (R)	**Fort Calhoun Station**	Comm Reactor	466	-	-	466
Nebraska (NE)	3	Adrian Smith (R)	Benjamin Sasse (R)	Cooper Nuclear Station	Comm Reactor	584	-	-	584
Nevada (NV)	4	Steven Horsford (D)	Catherine Cortez-Masto (D)	Nevada National Security Site	DOE Site	-	-	-	c
Nevada (NV)	4	Steven Horsford (D)	Jacky Rosen (D)	Yucca Mountain	DOE Site	-	-	-	-
New Hampshire (NH)	1	Chris Pappas (D)	Jeanne Shaheen (D) Maggie Hassan (D)	Seabrook Station	Comm Reactor	737	-	-	737
New Jersey (NJ)	2	Jefferson Van Drew (D)	Bob Menendez (D)	Hope Creek Generating Station	Comm Reactor	886	-	-	886
New Jersey (NJ)	2	Jefferson Van Drew (D)	Cory Booker (D)	Salem Nuclear Generating Station	Comm Reactor	1,657	-	-	1,657
New Jersey (NJ)	3	Andy Kim (D)		Oyster Creek Nuclear Generating Station	Comm Reactor	797	-	-	797
New Jersey (NJ)	12	Bonnie Watson Coleman (D)		Princeton Plasma Physics Laboratory	DOE National Lab	-	-	-	b

Table F-1 (continued)

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
New Mexico (NM)	1	Debra Haaland (D)	Martin Heinrich (D)	University of New Mexico AGN-201	University Reactor	-	-	-	a
New Mexico (NM)	2	Xochitl Torres Small (D)	Ben Ray Luján (D)	Eddy-Lea Energy Alliance LLC	Potential SNF Storage Site	-	-	-	-
New Mexico (NM)	2	Xochitl Torres Small (D)		Sandia National Laboratory	DOE National Lab w/ Reactor	-	-	-	a
New Mexico (NM)	2	Xochitl Torres Small (D)		White Sands Missile Range	DOE Site	-	-	-	c
New Mexico (NM)	3	Teresa Fernandez (D)		Los Alamos National Laboratory	DOE National Lab	-	-	-	b
New York (NY)	1	Lee Zeldin (R)	Chuck Schumer (D)	Brookhaven National Laboratory	DOE National Lab	-	-	-	b
New York (NY)	17	Nita Lowey (D)	Kirsten Gillibrand (D)	Indian Point Nuclear Generating	Comm Reactor	1,687	-	-	1,687
New York (NY)	20	Paul D. Tonko (D)		Rensselaer Polytechnic Institute	University Reactor	-	-	-	a
New York (NY)	21	Elise Stefanik (R)		MARF and S8G Submarine Prototypes	Naval Training Reactor	-	-	-	a
New York (NY)	23	Tom Reed (R)		West Valley Site	DOE Managed Comm HLW Site	-	-	640	640
New York (NY)	24	John Katko (R)		James A. FitzPatrick Nuclear Power Plant	Comm Reactor	767	-	-	767
New York (NY)	24	John Katko (R)		Nine Mile Point Nuclear Station	Comm Reactor	1,524	-	-	1,524
New York (NY)	24	John Katko (R)		R.E. Ginna Nuclear Power Plant	Comm Reactor	561	-	-	561
North Carolina (NC)	4	David Price (D)	Richard Burr (R)	Shearon Harris Nuclear Power Plant	Comm Reactor	1,631	-	-	1,631
North Carolina (NC)	4	David Price (D)	Thom Tillis (R)	North Carolina State University PULSTAR	University Reactor	-	-	-	a
North Carolina (NC)	7	David Rouzer (R)		Brunswick Steam Electric Plant	Comm Reactor	964	-	-	964
North Carolina (NC)	9	Dan Bishop (R)		McGuire Nuclear Station	Comm Reactor	1,868	-	-	1,868

Table F-1 (continued)

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
Ohio (OH)	3	Joyce Beatty (D)	Sherrod Brown (D)	Ohio State University OSURR	University Reactor	-	-	-	a
Ohio (OH)	9	Marcy Kaptur (D)	Rob Portman (R)	Davis-Besse Nuclear Power Station	Comm Reactor	680	-	-	680
Ohio (OH)	14	David Joyce (R)		Perry Nuclear Power Plant	Comm Reactor	833	-	-	833
Oregon (OR)	1	Suzanne Bonamici (D)	Ron Wyden (D)	**Trojan**	Comm Reactor	359	-	-	359
Oregon (OR)	3	Earl Blumenauer (D)	Jeff Merkley (D)	Reed College RRR	University Reactor	-	-	-	a
Oregon (OR)	4	Peter DeFazio (D)		Oregon State University OSTR	Non DOE Res Reactor	-	-	-	a
Pennsylvania (PA)	4	Madeleine Dean (D)	Bob Casey Jr (D)	Peach Bottom	Comm Reactor	2,181	-	-	2,181
Pennsylvania (PA)	5	Mary Gay Scanlon (D)	Pat Toomey (R)	Pennsylvania State University	University Reactor	-	-	-	a
Pennsylvania (PA)	6	Chrissy Houlahan (D)		Limerick Generating Station	Comm Reactor	1,704	-	-	1,704
Pennsylvania (PA)	11	Lloyd Smucker (R)		Susquehanna Steam Electric Station	Comm Reactor	1,945	-	-	1,945
Pennsylvania (PA)	12	Fred Keller (R)		Beaver Valley Power Station	Comm Reactor	1,358	-	-	1,358
Pennsylvania (PA)	14	Guy Reschenthaler (R)		National Energy Technology Laboratory	DOE National Lab	-	-	-	b
Pennsylvania (PA)	15	Glenn Thompson (R)		**Three Mile Island Nuclear Station**	Comm Reactor	786	-	-	786
Rhode Island (RI)	2	Jim Langevin (D)	Jack Reed (D) Sheldon Whitehouse (D)	Rhode Island Atomic Energy Commission Nuclear Science Center	Non DOE Res Reactor	-	-	-	a

Table F-1 (continued)

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
South Carolina (SC)	1	Joe Cunningham (D)	Lindsey Graham (R)	Moored Training Ship - Unit #1 and Unit 2	Naval Training Reactor	-	-	-	c
South Carolina (SC)	2	Joe Wilson (R)	Tim Scott (R)	Savannah River National Laboratory	DOE National Lab	-	27	4,060	4,087
South Carolina (SC)	3	Jeff Duncan (R)		Oconee Nuclear Station	Comm Reactor	2,468	-	-	2,468
South Carolina (SC)	5	Ralph Norman (R)		Catawba Nuclear Station	Comm Reactor	1,599	-	-	1,599
South Carolina (SC)	5	Ralph Norman (R)		Virgil C. Summer Nuclear Station	Comm Reactor	700	-	-	700
South Carolina (SC)	7	Tom Rice (R)		H. B. Robinson Steam Electric Plant	Comm Reactor	407	-	-	407
Tennessee (TN)	3	Chuck Fleischmann (R)	Bill Hagerty (R)	Oak Ridge National Laboratory	DOE National Lab w/ Reactor	-	-	-	a
Tennessee (TN)	3	Chuck Fleischmann (R)	Marsha Blackburn (R)	Sequoyah Nuclear Plant	Comm Reactor	1,684	-	-	1,684
Tennessee (TN)	4	Scott DesJarlais (R)		Watts Bar Nuclear Plant	Comm Reactor	706	-	-	706
Texas (TX)	10	Michael T. McCaul (R)	John Cornyn (R)	University of Texas TRIGA II	University Reactor	-	-	-	a
Texas (TX)	11	K. Michael Conaway (R)	Ted Cruz (R)	Interim Storage Partners	Potential SNF Storage Site	-	-	-	-
Texas (TX)	17	Pete Sessions (R)		Texas A&M University AGN-201	University Reactor	-	-	-	a
Texas (TX)	17	Pete Sessions (R)		Texas A&M University NSCR	University Reactor	-	-	-	a
Texas (TX)	25	Roger Williams (R)		Comanche Peak Steam Electric Station	Comm Reactor	1,455	-	-	1,455
Texas (TX)	27	Michael Cloud (R)		South Texas Project	Comm Reactor	1,607	-	-	1,607
Utah (UT)	2	Chris Stewart (R)	Mitt Romney (R) Mike Lee (R)	University of Utah TRIGA	University Reactor	-	-	-	a
Vermont (VT)	1	Peter Welch (D)	Patrick Leahy (D) Bernie Sanders (I)	**Vermont Yankee Nuclear Power Plant**	Comm Reactor	706	-	-	706

Table F-1 (continued)

State	Congressional District	Representative	Senators	Facility Name (Bold = Shutdown)	Type of Facility	SNF at NPR/ISFSI Sites (MTHM)	SNF at DOE Sites (MTHM)	Reprocessing Waste (Equivalent MTHM)**	TOTAL (MTHM)
Virginia (VA)	3	Robert C. Scott (D)	Mark Warner (D)	Surry Nuclear Power Station	Comm Reactor	1,591	-	-	1,591
Virginia (VA)	3	Robert C. Scott (D)	Tim Kaine (D)	Thomas Jefferson National Accelerator Facility	DOE National Lab	-	-	-	b
Virginia (VA)	6	Ben Cline (R)		BWXT Technologies	Comm SNF R&D Center	-	-	-	b
Virginia (VA)	7	Abigail Spanberger (D)		North Anna Power Station	Comm Reactor	1,594	-	-	1,594
Washington (WA)	4	Dan Newhouse (R)	Patty Murray (D)	Columbia Generating Station	Comm Reactor	811	-	-	811
Washington (WA)	4	Dan Newhouse (R)	Maria Cantwell (D)	Hanford Site	DOE Site	-	2,129	3,900	6,029
Washington (WA)	4	Dan Newhouse (R)		Pacific Northwest	DOE National Lab	-	-	-	b
Washington (WA)	5	Cathy McMorris Rodgers (R)		Washington State University WSUR	University Reactor	-	-	-	a
Wisconsin (WI)	2	Mark Pocan (D)	Ron Johnson (R)	University of Wisconsin UWNR	University Reactor	-	-	-	a
Wisconsin (WI)	3	Ron Kind (D)	Tammy Baldwin (D)	**La Crosse**	Comm Reactor	38	-	-	38
Wisconsin (WI)	6	Glenn Grothman (R)		Point Beach Nuclear Plant	Comm Reactor	1,051	-	-	1,051
Wisconsin (WI)	8	Mike Gallagher (R)		**Kewaunee Power Station**	Comm Reactor	519	-	-	519
Total[d]						**86,584**	**2,479**	**10,500**	**99,562**

** Equivalent MTHM determined by using the nominal canister counts in Tables 2-8 and 3-7 and applying the historical factors of 2.3 and 0.5 MTU per canister for commercial and defense reprocessing waste respectively from DOE/DP 0020/1 "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste" (DOE 1985). Applying the total radioactivity method for determining equivalent MTHM would result in much lower quantities (INEEL 1999)."

[a] SNF from research reactors primarily used for radiography, testing, training, isotope production or other non-power generating commercial services are not included

[b] Small quantities of SNF or reprocessing waste used for R&D purposes, if any, are not included, e.g. for laboratory analysis work

[c] Nuclear material for critical assembly machines or naval prototypes or moored training ships are not included in this table.

[d] Totals for SNT in MTHM represents rounded sums of pre-rounded site values.

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Appendix G

Revision History

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A general description of the changes made to this document with each revision is provided in this appendix. Some of these revisions were only issued as drafts.

Revision 0 contains a single projection for NPR SNF future inventory based on 1) the discharged SNF at shutdown reactors and 2) on the currently operating reactors all obtaining a license extension and operating for 60 years (Section 2).

Revision 1 constitutes a significant revision with respect to the terminology used to identify site groups and with the respect to the addition of four new projection scenarios for NPR SNF. The new scenarios include: Alternative Scenario 1 – The incorporation of 6 new reactors that are currently under construction at four sites in addition to the assumptions of the Reference Scenario that was developed in Revision 0; Alternative Scenario 2 – The shutdown of all reactors at the end of their respective current operating license; Alternative Scenario 3 – The incorporation of the shutdown of 7 "Most Challenging" reactors as a modification to the Reference Scenario; and Alternative Scenario 4 – The incorporation of the shutdown of 14 "Most Challenging" reactors as a modification to the Reference Scenario. The "Most Challenging" reactors are determined from a number of recent publications indicating reactors with significant fiscal and political challenges. Finally, Revision 1 includes an update to current storage locations for SNF through 2013.

Revision 2 contains some corrections and updates to inventory data with regard to current storage locations for SNF discharged through 2013. The updated inventory is primarily due to the commencement of dry storage operations at Fermi 2, as well ongoing transitions at multiple reactor sites of SNF from wet storage to dry storage. The dry storage inventory data are current as of September 1, 2014.

Revision 3 contains some corrections and updates to inventory data with regard to current storage locations for SNF discharged through 2015. The updated inventory is primarily due to implementation the new spent SNF projection tool [Vinson, 2015]. Also, the current revision reflects commencement of dry storage operations at Pilgrim and Beaver Valley, as well as ongoing transitions at multiple reactor sites of SNF from wet storage to dry storage. The dry storage inventory data are current as of May 5, 2015.

Revision 4 updates the inventory data with regard to current storage locations for SNF discharged through 2016. Revision 4 reflects nine reactors which have had shutdown dates announced by their utilities since the issuance of Revision 3. The updated inventory reflects the new GC-859 utility provided historical inventory thru June 2013 and the new spent nuclear fuel projection tool [Vinson, 2015]. Also, commencement of dry storage operations at Calloway, in Missouri, and V.C. Summer, in South Carolina, is reflected in the current revision. The dry storage inventory data are current as of May 3, 2016.

Revision 5 updates the inventory data with regard to current storage locations for SNF discharged through 2017. This revision reflects commencement of operation of Watts Bar, Unit 2. Revision 5 reflects six reactors which have had shutdown dates announced by their utilities since the issuance of Revision 4. The updated inventory reflects the new GC-859 utility provided historical inventory thru June 2013 and the new spent nuclear fuel projection tool [Vinson, 2015]. Also, commencement of dry storage operations at Clinton, in Illinois, and Watts Bar, in Tennessee, is reflected in the current revision. The dry storage inventory data are current as of May 2, 2017.

Revision 6 updates the inventory data with regard to current storage locations for SNF discharged through 2018. This revision reflects Oyster Creek moving to a shutdown status. Revision 6 reflects seven reactors which have had shutdown dates announced by their utilities. The updated inventory reflects the GC-859 utility provided historical inventory thru June 2013 and the spent nuclear fuel projection tool [Vinson, 2015].

Revision 7 updates the inventory data with regard to current storage locations for SNF discharged through 2019. This revision reflects Three Mile Island Unit 1 and Pilgrim moving to a shutdown status. Revision 7 reflects six reactors which have had shutdown dates announced by their utilities. The updated inventory

reflects the GC-859 utility provided historical inventory thru June 2013 and the spent nuclear fuel projection tool [Vinson, 2015].

Revision 8 incorporates the latest GC-859 utility survey data collected through the end of 2017. The revision updates the inventory data with regard to current storage locations for SNF discharged through 2020. This revision reflects Indian Point Unit 2 and Duane Arnold moving to a shutdown status. Revision 8 reflects four reactors which have had shutdown dates announced by their utilities and six reactors which have an approved subsequent license application for an additional 20 years of operations.

Appendix H

Reference Scenario: No Replacement Nuclear Generation Forecast – State Inventory Data

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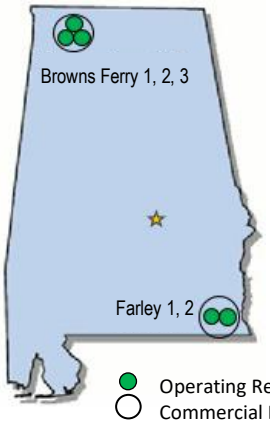
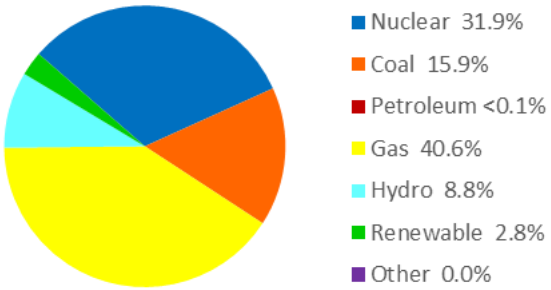
ALABAMA



Elected Officials as of January 2021[1,2]

Governor:	Kay Ivey (R)
Senators:	Richard Shelby (R)
	Tommy Tuberville (R)
Representatives:	
District 2:	Martha Roby (R)
District 5:	Mo Brooks (R)

Alabama: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

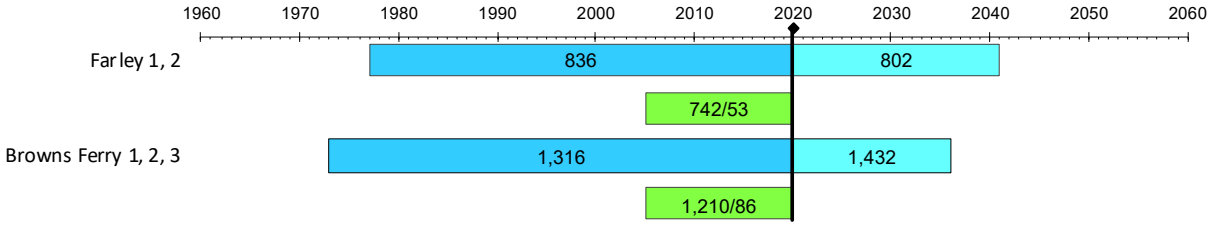


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Farley 1	Southern Nuclear Operating Co.	Martha Roby (R)	1977-2037	PWR/Operating	2005/GL	1,184
	Farley 2			1981-2041	PWR/Operating		1,196
5	Browns Ferry 1	Tennessee Valley Authority	Mo Brooks (R)	1973-2033	BWR/Operating	2005/GL	1,104
	Browns Ferry 2			1974-2034	BWR/Operating		1,492
	Browns Ferry 3			1976-2036	BWR/Operating		1,362

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,952 MTU in 139 casks **Pool: 2,150 MTU** **Total: 4,104 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$948.9 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

4 Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

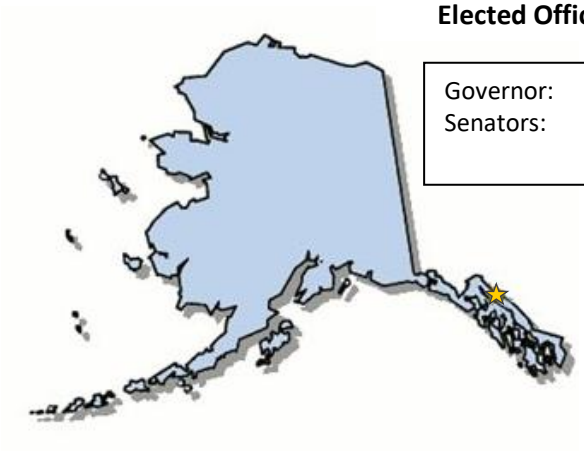
5 State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

6 Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

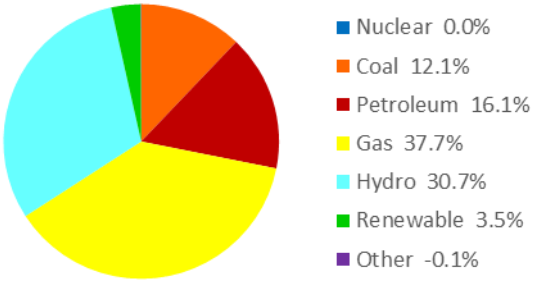
ALASKA

Elected Officials as of January 2021[1,2]



Governor:	Mike Dunleavy (R)
Senators:	Lisa Murkowski (R)
	Dan Sullivan (R)

Alaska: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)



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1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

ARIZONA

Elected Officials as of January 2021[1,2]

Governor:	Doug Ducey (R)
Senators:	Mark Kelly (D)
	Kyrsten Sinema (D)
Representative:	
District 3:	Raúl Grijalva (D)

Operating Reactors (3 at 1 site)
Commercial Dry Storage Site (1 site)

Arizona: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

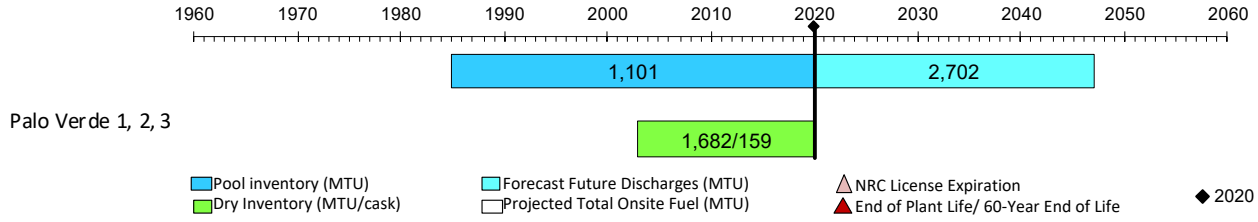
Nuclear 28.6%
Coal 12.6%
Petroleum <0.1%
Gas 46.7%
Hydro 6.0%
Renewable 6.1%
Other 0.0%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
3	Palo Verde 1	Arizona Public Service Co.	Raúl Grijalva (D)	1985-2045	PWR/Operating	2003/GL	1,773
	Palo Verde 2			1986-2046	PWR/Operating		1,826
	Palo Verde 3			1987-2047	PWR/Operating		1,886

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,682 MTU in 159 casks **Pool: 1,101 MTU** **Total: 2,702 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]

$686.6 million paid	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

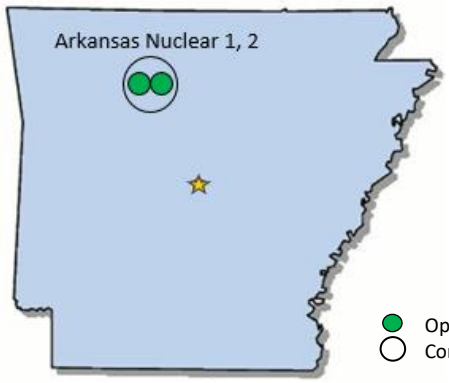
[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

ARKANSAS



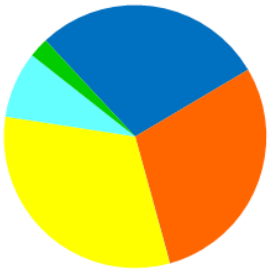
Operating Reactors (2 at 1 site)
Commercial Dry Storage Site (1 site)

Elected Officials as of January 2021[1,2]

Governor:	Asa Hutchinson (R)
Senators:	John Boozman (R)
	Tom Cotton (R)
Representative:	
District 3:	Steve Womack (R)

Arkansas: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



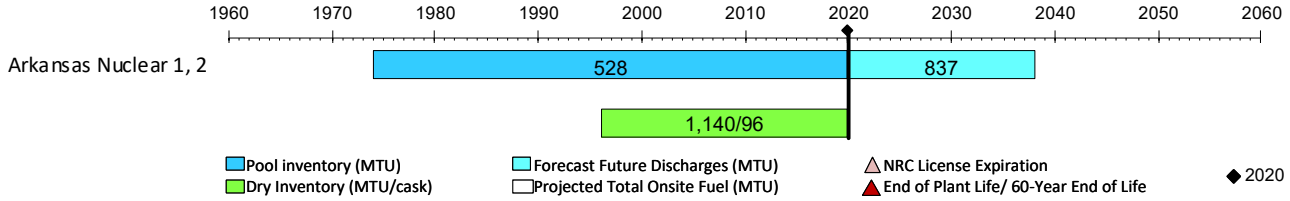
- Nuclear 28.5%
- Coal 29.1%
- Petroleum 0.1%
- Gas 31.7%
- Hydro 8.2%
- Renewable 2.4%
- Other 0.0%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
3	Arkansas Nuclear 1	Entergy Nuclear Operations, Inc.	Steve Womack (R)	1974-2034	PWR/Operating	1996/GL	1,138
	Arkansas Nuclear 2			1978-2038	PWR/Operating		1,367

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,140 MTU in 96 casks **Pool: 528 MTU** **Total: 1,668 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$367.1 million paid	**$192.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

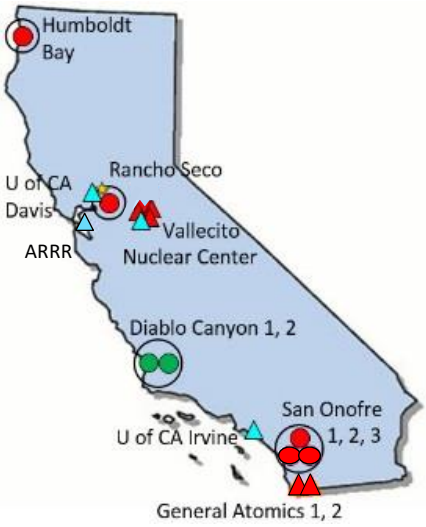
4 Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

5 State total estimated SNF in dry and pool storage as of December 31, 2020 in Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

6 Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

7 The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

CALIFORNIA



Elected Officials as of January 2021[1,2]

Governor:	Gavin Newsom (D)
Senators:	Dianne Feinstein (D)
	Alejandro Padilla (D)
Representatives:	
District 2:	Jared Huffman (D)
District 6:	Doris O. Matsui (D)
District 7:	Ami Bera (D)
District 15:	Eric Swalwell (D)
District 24:	Salud Carbajal (D)
District 45:	Katie Porter (D)
District 49:	Mike Levin (D)
District 52:	Scott Peters (D)

- Shutdown Reactors (5 at 3 sites)
- Operating Reactors (2 at 1 site)
- Commercial Dry Storage Site (4 sites)
- Operating Research Reactors (4 at 4 sites)
- Shutdown Research Reactors (5 at 2 sites)

*no fuel on-site at General Atomics facilities

California: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

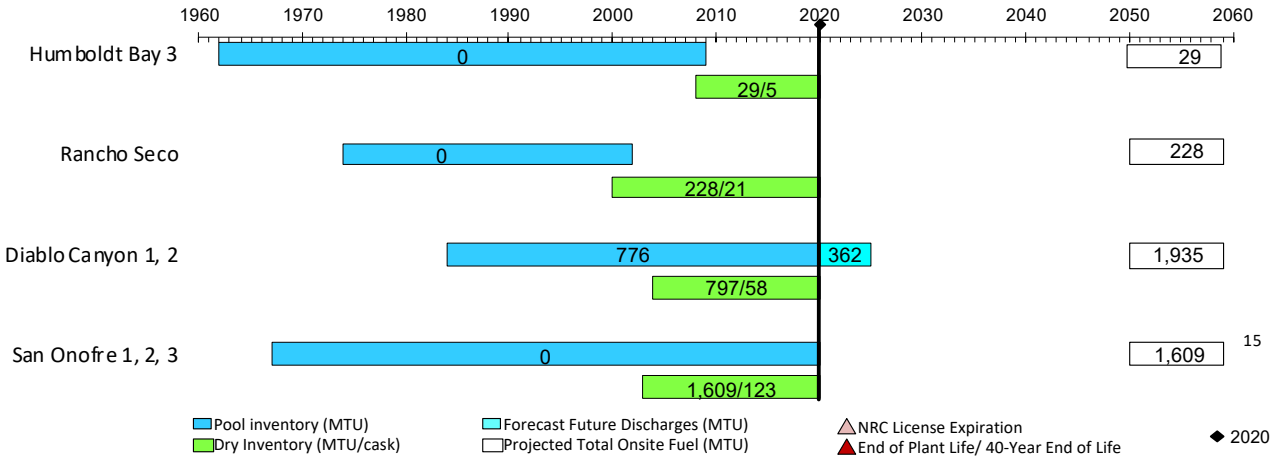
Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Humboldt Bay 3	Pacific Gas & Electric Company	Jared Huffman (D)	1963-1976/ DECON in progress	BWR/ Shutdown	2005/SL	29
6	University of California - Davis	University of California	Doris O. Matsui (D)	1998- License R-130	R&TRF TRIGA Mark II, 2,300kW / Operating		
7	Rancho Seco	Sacramento Municipal Utility District	Ami Bera (D)	1974-1989/ DECON completed	PWR/ Shutdown	2000/SL	228
15	Aerotest Radiography and Research Reactor (ARRR)	Nuclear Labrinith Aerotest[8]	Eric Swalwell (D)	1965- License R-98	R&TRF TRIGA Mark I, 250kW / Operating[8]		
	Vallecitos Boiling Water Reactor (VBWR)	GE Hitachi Nuclear Energy/ Vallecitos Nuclear Center[12]		1957-1963 / SAFSTOR[9] possession only License DPR-1	BWR/ Shutdown		
	General Electric Test Reactor (GETR)			1986-2016/ SAFSTOR[10] possession only License TR-1	R&TRF/ Shutdown[11]		
	Vallecitos Experimental Superheat Reactor (VESR)			1970-2016/ SAFSTOR[10] possession only License DR-10	R&TRF/ Shutdown[11]		
	Nuclear Test Reactor (NTR)			1957-2021 License R-33	R&TRF Nuclear Test, 100kW/ Operating		

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
24	Diablo Canyon 1	Pacific Gas & Electric Company	Salud Carbajal (D)	1984-2024[13]	PWR/ Operating	2004/SL	962
	Diablo Canyon 2			1985-2025[13]	PWR/ Operating		973
45	University of California - Irvine	University of California	Katie Porter (D)	1969- License R-116	R&TRF TRIGA Mark 1, 250kW/ Operating		
49	San Onofre 1	Southern California Edison Co.	Mike Levin (D)	1968-1992/ DECON SAFSTOR	PWR/ Shutdown	2003/GL	245[14]
	San Onofre 2			1982-2013/ DECON in Progress	PWR/ Early Shutdown		730
	San Onofre 3			1983-2013/ DECON in Progress	PWR/ Early Shutdown		733
52	General Atomics	General Atomics	Scott Peters (D)	1957-1997/ SAFSTOR	R&TRF TRIGA Mark I/ Shutdown		
	General Atomics			1960-1995/ DECON	R&TRF TRIGA Mark F/ Shutdown		

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 2,663 MTU in casks **Pool: 776 MTU** **Total: 3,439 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$953.0 million paid[16]	**$0.8 million one-time fee owed[17]**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

4 Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] Ownership issues have been resolved and Nuclear Labyrinth is now the parent company of ARRR, the license renewal is under NRC review Source: ADAMS ML17277B261.

[9] No fuel on site. The licensee plans to maintain the facility in SAFSTOR until ongoing site nuclear activities are terminated and the entire site can be decommissioned in an integrated fashion. Estimated date of closure is 2025.

[10] NRC issued a possession-only license for GETR and VESR on February 5, 1986. The license was renewed on September 30, 1992; licensee requested continuation of their current license 12/15/15.

[11] Expected closure in 2025.

[12] There are also hot cells that are used for power reactor fuel post irradiation examination.

[13] Shutdown announced for the end of initial license period.

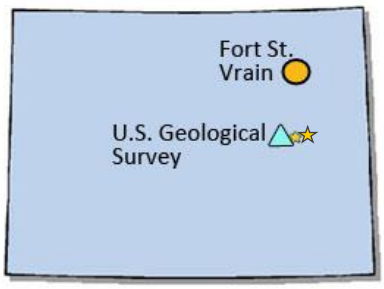
[14] Includes 98 MTU transferred to Morris, Illinois.

[15] Does not include 98 MTU from San Onofre 1 transferred to Morris, Illinois.

[16] Includes one-time fee paid by GE for Vallecitos.

[17] Includes one-time fee owed by Aerotest.

COLORADO



Operating Research Reactor (1 at 1 site)
DOE owned SNF (1 site)

Elected Officials as of January 2021[1,2]

Governor:	Jared Polis(D)
Senators:	Michael Bennet (D)
	John Hickenlooper (D)
Representatives:	
District 4:	Ken Buck (R)
District 7:	Ed Perlmutter (D)

Colorado: 2020 Electricity Generation Mix[3]

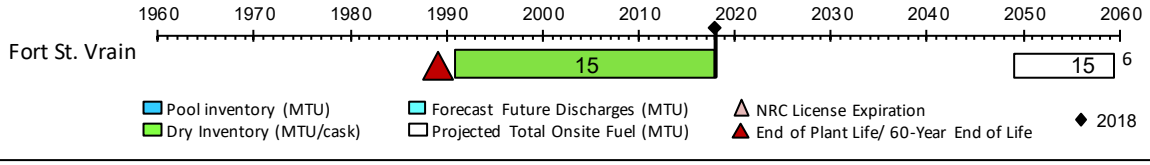
(includes utilities and independent power producers)

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
4	Fort St. Vrain	DOE	Ken Buck (R)	1973-1989/ DECON completed	HTGR/ Shutdown	1991-2031/ SL	24
7	US Geological Survey (USGS)	USGS	Ed Perlmutter (D)	1969- License R-113	R&TRF TRIGA Mark I, 1,000kW/ Operating		

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 15 MTHM in 244 canisters (vault) Pool: 0 MTHM Total: 15 MTHM

SPENT NUCLEAR FUEL STORAGE STATUS



NUCLEAR WASTE FUND[7]	
$0.2 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

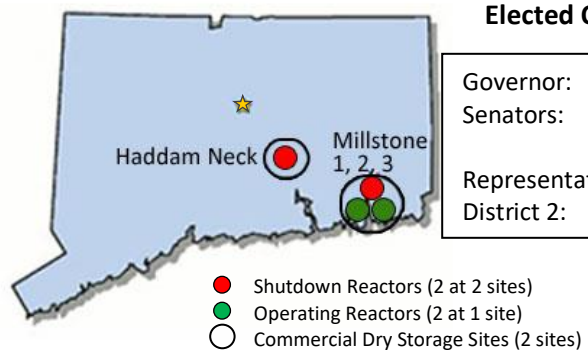
4 Actual SNF discharges Includes 8.6 MTU transferred to INL.

5 State total SNF in dry a storage as of December 31, 2020. *Spent Nuclear Fuel and High-Level Radioactive Waste Inventory Report* [FCRD-NFST-2013-000263, Rev 7]. This quantities excludes 8.6 MTU transferred to INL.

6 State total SNF in dry a storage as of December 31, 2020. *Spent Nuclear Fuel and High-Level Radioactive Waste Inventory Report* [FCRD-NFST-2013-000263, Rev 7]. This quantities excludes 8.6 MTU transferred to INL.

7 The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

CONNECTICUT

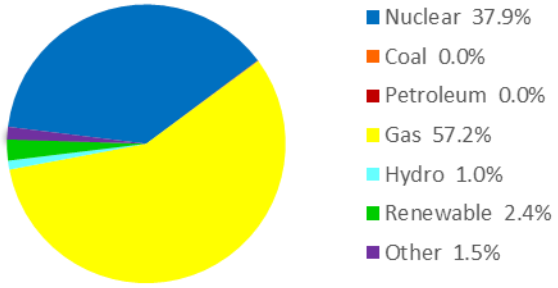


Elected Officials as of January 2021[1,2]

Governor:	Ned Lamont (D)
Senators:	Richard Blumenthal (D)
	Christopher Murphy (D)
Representative:	
District 2:	Joe Courtney (D)

Connecticut: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

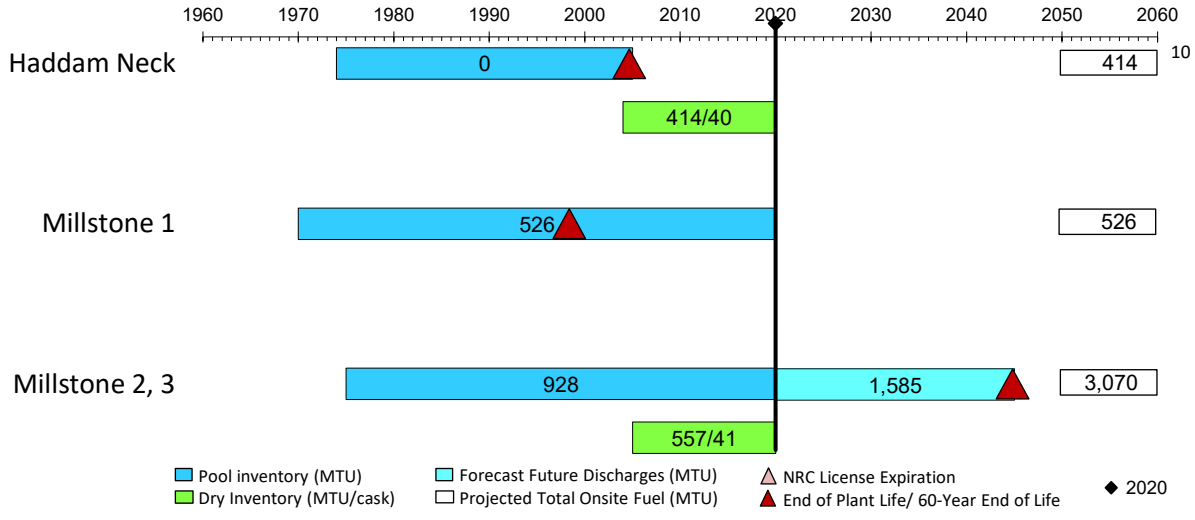


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Haddam Neck	Connecticut Yankee Atomic Power	Joe Courtney (D)	1967-1996 DECON completed	PWR/Shutdown	2004/GL	448[8-9]
	Millstone 1	Dominion Nuclear Conneticut, Inc		1970-1998 SAFSTOR	BWR/Shutdown		526
	Millstone 2			1975-2035	PWR/Operating	2005/GL	1,092
	Millstone 3			1986-2045	PWR/Operating		1,452

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 971 MTU in 81 casks **Pool: 1,378 MTU** **Total: 2,425 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$923.9 million paid	**$11.7 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] Total reactor discharges includes 34 MTU transferred to Morris, Illinois.

[9] Total reactor discharges includes 0.41 MTU transferred to Idaho National Laboratory.

[10] SNF in storage does not include 34 MTU transferred to Morris, Illinois.

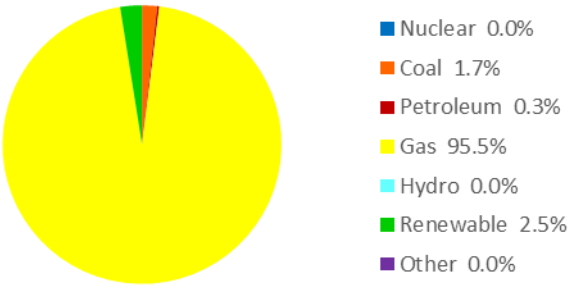
DELAWARE

Elected Officials as of January 2021[1,2]

Governor:	John Carney (D)
Senators:	Tom Carper (D)
	Chris Coons (D)

Delaware:2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

FLORIDA

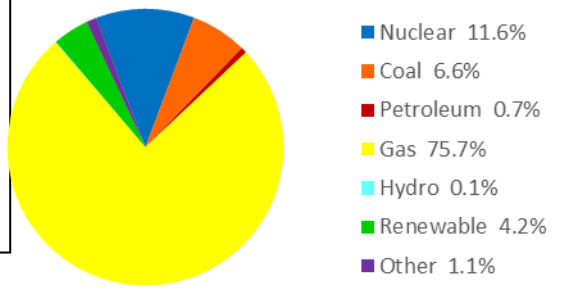
Shutdown Reactor (1 at 1 site)
Operating Reactors (4 at 2 sites)
Commercial Dry Storage Sites (2 sites)
Operating Research Reactor (1 at 1 site)

Elected Officials as of January 2021[1,2]

Governor:	Ron Desantis (R)
Senators:	Rick Scott (R)
	Marco Rubio (R)
Representatives:	
District 3:	Katherine Cammack (R)
District 11:	Daniel Webster (R)
District 18:	Brian Mast (R)
District 27:	Maria Salazar (R)

Florida: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

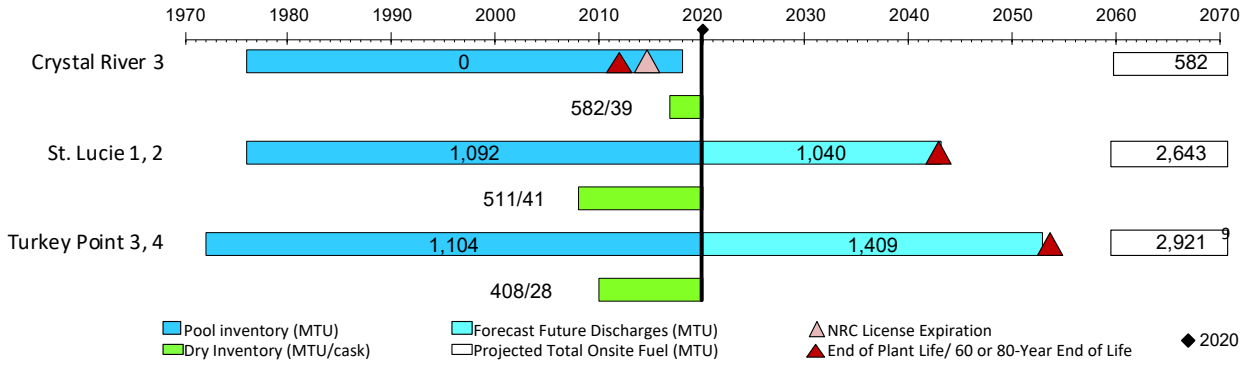


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
3	University of Florida	University of Florida	Katherine Cammack (R)	1959-License R-56	R&TRF Argonaut, 100Kw/ Operating		
11	Crystal River 3	Duke Energy Florida, Inc.	Daniel Webster (R)	1977-2016[7] SAFSTOR in progress	PWR/ Shutdown 2013	2017/GL	582
18	St. Lucie 1	Florida Power & Light Co.[11]	Brian Mast (R)	1976-2036	PWR/Operating	2008/GL	1,298
	St. Lucie 2			1983-2043	PWR/Operating		1,345
27	Turkey Point 3		Maria Salazar (R)	1972-2052[10]	PWR/Operating	2010/GL	1,448[8]
	Turkey Point 4			1973-2053[10]	PWR/Operating		1,481[8]

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,501 MTU in 108 casks **Pool: 2,196 MTU** **Total: 3,697 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$887.0 million paid	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

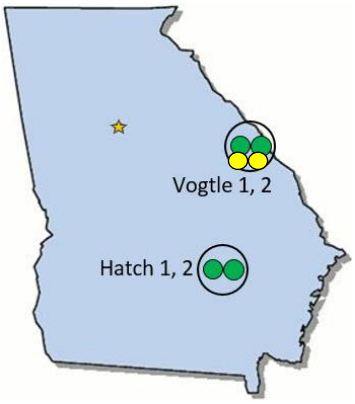
[8] Discharges includes 8 MTU transferred to Idaho National Lab.

[9] SNF in storage does not include 8 MTU transferred to Idaho National Lab.

[10] Turkey Point Units 3 and 4 were the first reactors in the United States to receive a subsequent (or second) 20 year operating license extension. These units are now licensed to operate a total of 80 years. This operational period is reflected in the reference scenario and this table.

[11] A subsidiary of Nextra.

GEORGIA

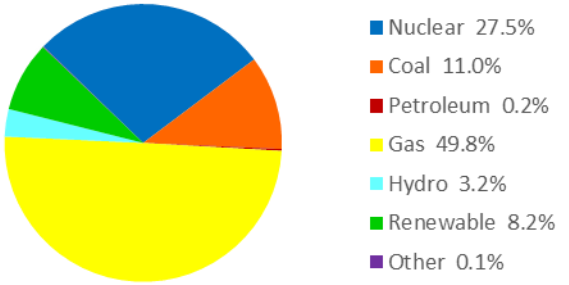


Elected Officials as of January 2021[1,2]

Governor:	Brian Kemp (R)
Senators:	Jon Ossoff (D)
	Raphael Warnock (D)
Representatives:	
District 1:	Earl Carter (R)
District 12:	Rick Allen (R)

Reactors Under Construction (2 at 1 site)
Operating Reactors (4 at 2 sites)
Commercial Dry Storage Site (2 sites)

Georgia: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

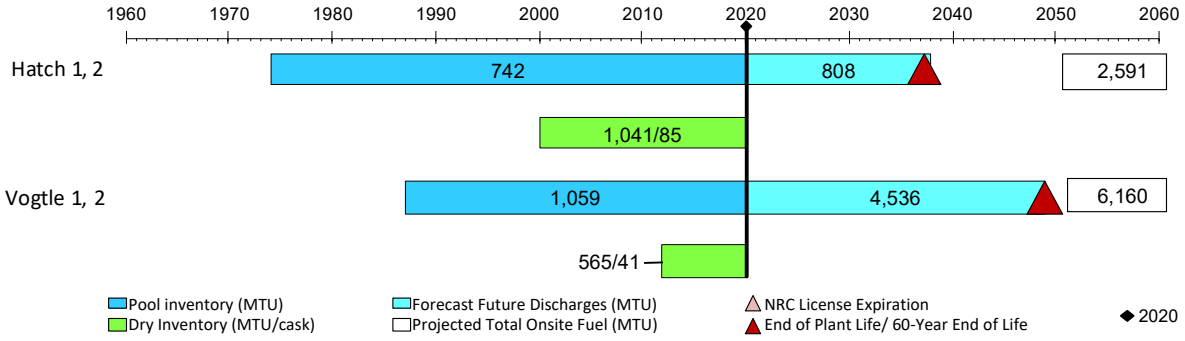


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Hatch 1	Southern Nuclear Operating Co.	Earl Carter (R)	1974-2034	BWR/Operating	2000/GL	1,268
	Hatch 2			1978-2038	BWR/Operating		1,323
12	Vogtle 1		Rick Allen (R)	1987-2047	PWR/Operating	2012/GL	1,596
	Vogtle 2			1989-2049	PWR/Operating		1,530
	Vogtle 3			2021/Planned	PWR/Under Construction		
	Vogtle 4			2022/Planned	PWR/Under Construction		

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,606 MTU in 126 casks **Pool: 1,801 MTU** **Total: 3,407 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]

$846.1 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

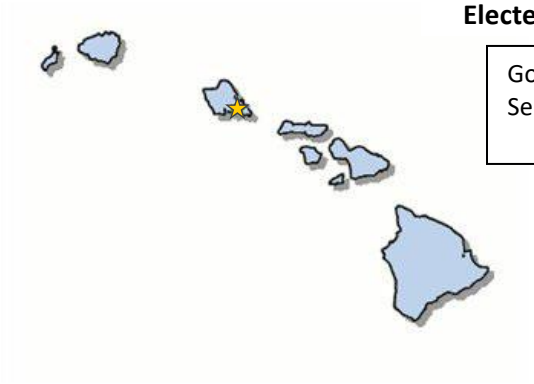
[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

HAWAII

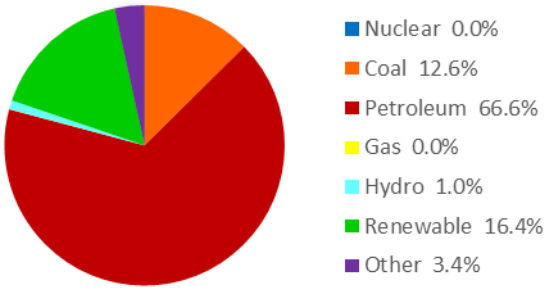


Elected Officials as of January 2021[1,2]

Governor:	David Ige (D)
Senators:	Brian Schatz (D)
	Mazie Hirono (D)

Hawaii: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

IDAHO

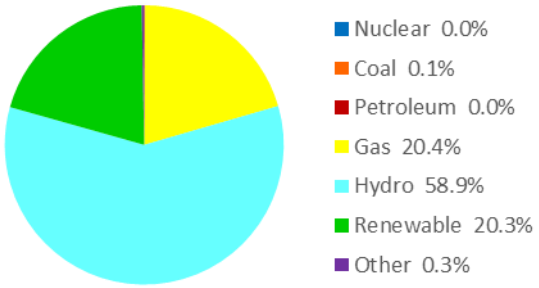
Elected Officials as of January 2021[1,2]

Governor:	Brad Little (R)
Senators:	Mike Crapo (R)
	James Risch (R)
Representative:	
District 2:	Mike Simpson (R)

- Operating Reactor (1 at 1 site)
- DOE owned ISFSI at INL, licensed but not constructed
- DOE owned TMI-2 ISFSI at INL
- DOE owned SNF and Reprocessing Waste at INL
- Surplus Plutonium at INL
- Naval SNF
- DOE Research Reactor

Idaho: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

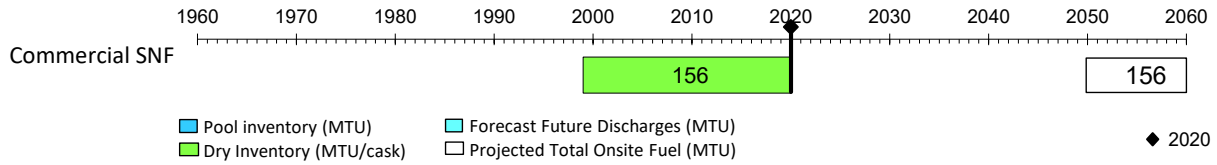


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/ Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Idaho State Univ.	Idaho State Univ.	Mike Simpson (R)	1967- License R-110	AGN-201 #103, 0.005kW/ Operating		
	Idaho National Laboratory (INL)[5-7]	DOE[16]		1948-	National Laboratory		
	Advanced Test Reactor Critical Facility			1964-	Test reactor		
	Neutron Radiography Facility			mid-1970s	R&TRF TRIGA		
	INL: Advanced Test Reactor (ATR)[8]			1967-	Test reactor		
	Transient Test Reactor (TREAT)			1959-	Test Reactor		
	INL: Materials and Fuels Complex[9]					See Note [11]	See Note [10]
	INL: CPP-603, Irradiated Fuel Storage Basins			1974-2035[11]	Dry storage	See Note [11]	See Note[12]
	INL: CPP-666 Fuel Storage Basins			1984-2035[11]	Pool storage	See Note [11]	See Note [8]
	INL: CPP-749, Underground Storage Vaults			1971-2035[11]	Dry storage	See Note [11]	
	INL: CPP-2707, Cask Pad and Rail Car			2003-2035[11]	Dry storage	See Note [11]	See note[13]
	INL TMI-2			1999-2019[13]	Dry storage	1999/SL	See Note[14]
	INL Idaho Spent Fuel Facility (ISFF)			Licensed, but not yet constructed[15]	Dry storage	2004/SL	
	Naval Reactors Facility	NNSA[16]			Various		

COMMERCIAL SPENT FUEL ONSITE INVENTORY[4]

Dry: 156 MTU **Pool: 0 MTU** **Total: 156 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[4]



NUCLEAR WASTE FUND[17]	
$0.0 million paid	**$0.0 million one-time fee owed**

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1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

4 Values are for commercial SNF as identified in Section 2.1.2 of *Spent Nuclear Fuel and High-Level Radioactive Waste Inventory Report* [FCRD-NFST-2013-000263, Rev 8]. Commercial SNF at INL includes 81.6 MTHM from TMI-2 core debris, 8.6 MTHM transferred from Ft. St. Vrain, and the balance from various R&D programs. INL also has approximately 114 MTHM of SNF from DOE and other sources for a total of 271 MTHM of DOE-Managed SNF, excluding Navy SNF.

5 Since 1951, 52 reactors have been built on the grounds of what was originally the Atomic Energy Commission's National Reactor Testing Station, currently the location of Idaho National Laboratory. Only 3 reactors continue to operate. The 49 other experimental test reactors have been decommissioned.

6 The INL received SNF and debris from Three Mile Island 2 (Pennsylvania).

7 The INL receives SNF from foreign research reactors (FRR) and domestic research reactors (DRR).

8 SNF removed from ATR is temporarily maintained in the reactor canal before it is transferred to CPP-666 (basins) for storage.

9 Materials and Fuels Complex, formerly Argonne West, was part of Argonne National Laboratory (Illinois) until 2004 when it was incorporated into the INL.

10 SNF from Experimental Breeder Reactor-II (EBR-2) is stored in cylinders in the Radioactive Scrap and Waste Facility. SNF from the Hanford Fast Flux Test Facility (HFFTF) is stored in the Hot Fuel Examination Facility.

11 DOE regulated facility. The DOE Authorization Basis for all DOE-regulated SNF facilities assumes operations through 2035.

12 Receipt of approximately 14 MTU of Foreign Research Reactor (FRR) and Domestic Research Reactor (DRR) SNF is expected through 2035.

13 Includes 6 casks containing fuel from the Test Area North Fuel Examination Facility plus a rail car holding 2 casks from West Valley (New York) containing SNF of commercial origin.

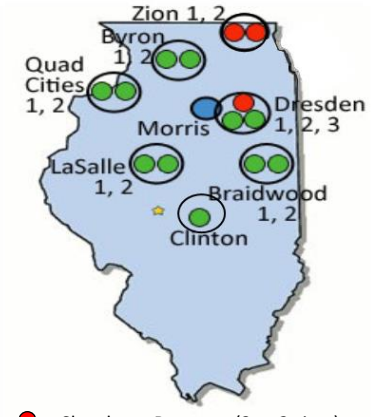
14 Contains Three Mile Island 2 fuel debris.

15 Not yet constructed. Purpose is to receive INL SNF.

16 DOE Regulated Facilities.

17 The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

ILLINOIS



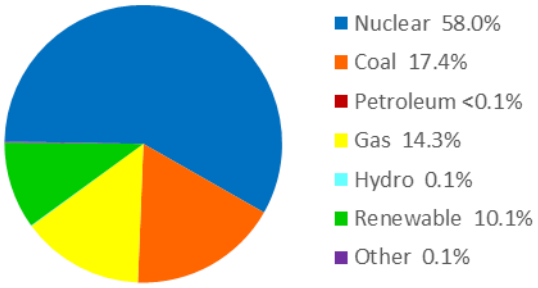
- Shutdown Reactors (3 at 2 sites)
- Operating Reactors (11 at 6 sites)
- Commercial Dry Storage Sites (7 sites)
- Commercial Pool Storage Site (1 site)

Elected Officials as of January 2021[1,2]

Governor:	J. B. Pritzker (R)
Senators:	Richard Durbin (D)
	Tammy Duckworth (D)
Representatives:	
District 10:	Bradley Schneider (D)
District 13:	Rodney Davis (R)
District 16:	Adam Kinzinger (R)
District 17:	Cheri Bustos (D)

Illinois: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

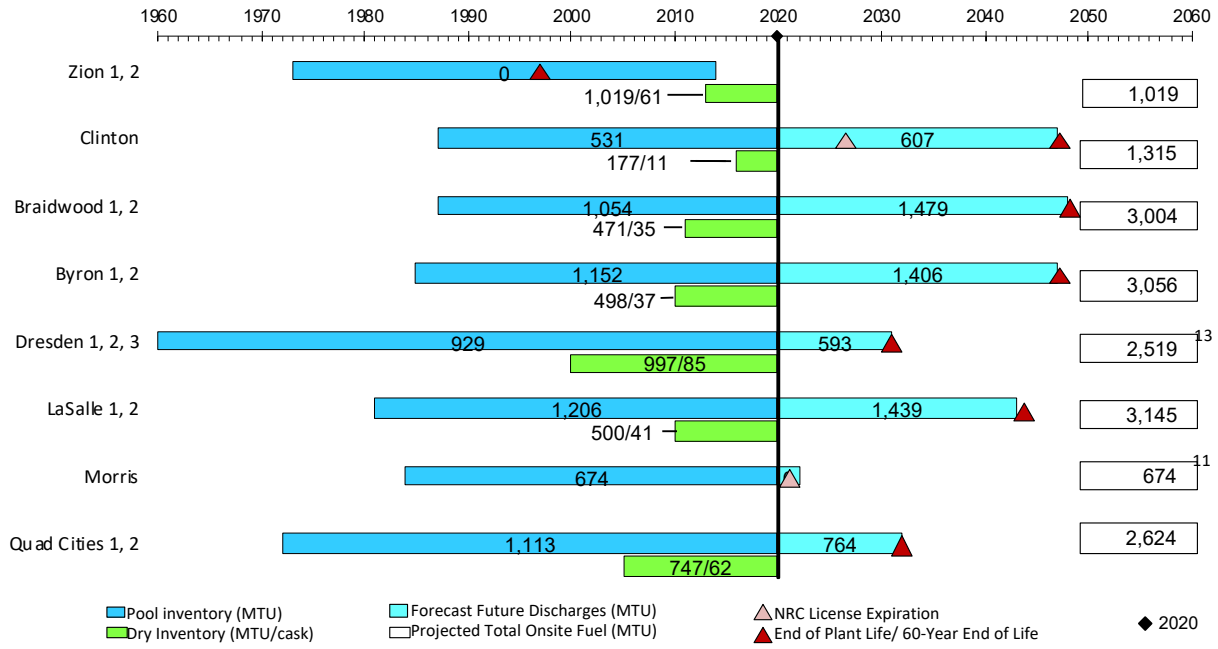


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
10	Zion 1	Zion Solutions	Bradley Schneider (D)	1973-1997/ DECON in progress	PWR/Shutdown[8]	2014/GL	524
	Zion 2			1973-1996/ DECON in progress	PWR/Shutdown[8]		495
13	Clinton	Exelon Generation Co., LLC	Rodney Davis (R)	1987-2027[15]	BWR/Operating	2016/GL	1,315
16	Braidwood 1		Adam Kinzinger (R)	1987-2046	PWR/Operating	2011/GL	1,477
	Braidwood 2			1988-2047	PWR/Operating		1,527
	Byron 1			1985-2044	PWR/Operating	2010/GL	1,528
	Byron 2			1987-2046	PWR/Operating		1,528
	Dresden 1			1959-1978 SAFSTOR	BWR/Shutdown	2000/GL	91[9]
	Dresden 2			1991-2029	BWR/Operating		1,366[10]
	Dresden 3			1971-2031	BWR/Operating		1,213
	LaSalle 1			1982-2042	BWR/Operating	2010/GL	1,544
	LaSalle 2			1983-2043	BWR/Operating		1,601
	Morris	GE-Hitachi Nuclear Energy Americas LLC		1984-2022	SNF Storage	1982/SL	674[11,12]
17	Quad Cities 1	Exelon Generation Co., LLC	Cheri Bustos (D)	1972-2032	BWR/Operating	2005/GL	1,328
	Quad Cities 2			1972-2032	BWR/Operating		1,296

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 4,409 MTU in 332 casks **Pool: 6,659 MTU** **Total: 11,068 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$2,261.2 million paid[14]	**$1,081.7 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

4 Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

5 State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

6 Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

7 The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

8 Permanently shutdown February 13, 1998.

9 Discharges includes 0.26 MTU transferred to Idaho National Laboratory.

10 Discharges includes 145 MTU transferred to Morris.

11 Morris received SNF from the following facilities.

State	Facility	MTU to Morris
California	San Onofre 1	98.41
Connecticut	Haddam Neck	34.48
Illinois	Dresden 2	145.19
Minnesota	Monticello	198.19
Nebraska	Cooper	198.02
	Total	**674.29**

[12] On this table, the Total Projected SNF at Morris includes all SNF transferred from other facilities to Morris, including 145 MTU transferred from Dresden 2 to Morris. The Total Projected SNF from Dresden 2 also includes this 145 MTU which is consistent with how quantities are reported in this column. The result is that 145 MTU from Dresden 2 shows up twice on this Table, whereas on the Commercial Nuclear Fuel Onsite Inventory Figure, it shows up only once – in the Morris onsite inventory.

[13] Does not include 145 MTU transferred to Morris or 0.26 MTU transferred to Idaho National Laboratory.

[14] Includes one-time fee paid by GE for Morris.

[15] Clinton has not applied for an operating license extension.

INDIANA

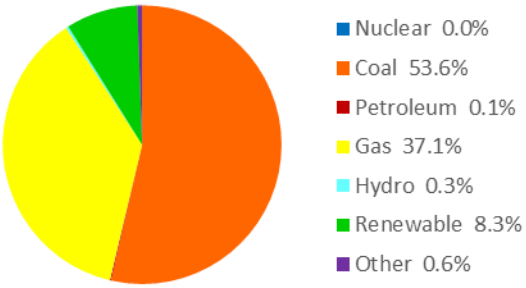
Operating Research Reactor (1 at 1 site)

Elected Officials as of January 2021[1,2]

Governor:	Eric Holcomb (R)
Senators:	Todd Young (R)
	Mike Braun (R)
Representative:	
District 4:	James Baird (R)

Indiana: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



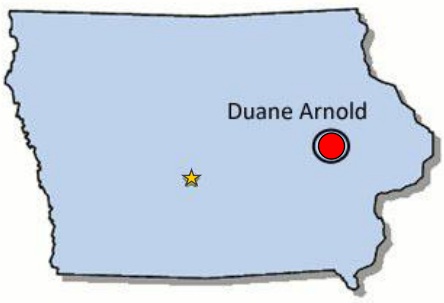
Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected
4	Purdue University	Purdue University	James Baird (R)	1962-License R-87	R&TRF Lockheed, 1kW/ Operating		

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

IOWA

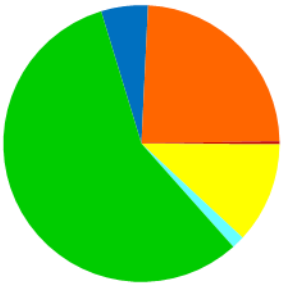


Shutdown Reactor (1 at 1 site)
Commercial Dry Storage Site (1 site)

Elected Officials as of January 2021[1,2]

Governor:	Kim Reynolds (R)
Senators:	Charles Grassley (R)
	Joni Ernst (R)
Representative:	
District 1:	Ashley Hinson (R)

Iowa: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)



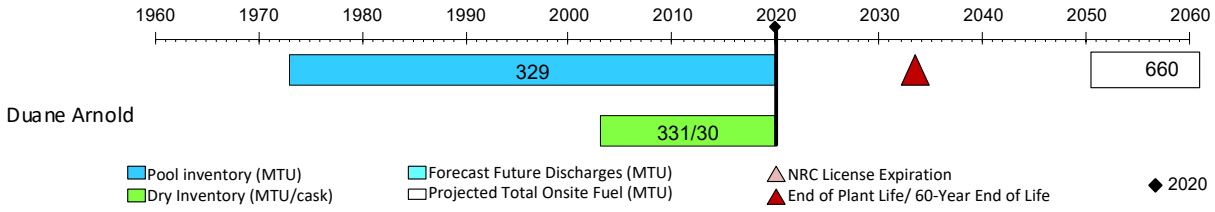
- Nuclear 5.5%
- Coal 24.0%
- Petroleum 0.4%
- Gas 11.8%
- Hydro 1.5%
- Renewable 56.9%
- Other 0.1%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Duane Arnold	NextEra Energy Duane Arnold, LLC	Ashley Hinson (R)	1974-2020	BWR/Shutdown	2003/GL	660

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 331 MTU in 30 casks **Pool: 329 MTU** **Total: 660 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$137.1 million paid	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

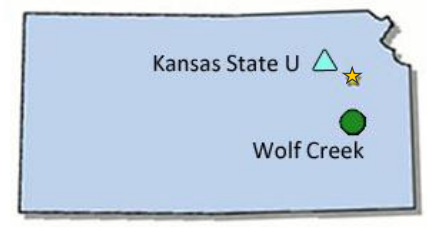
[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

KANSAS



Operating Reactor (1 at 1 site)
Operating Research Reactor (1 at 1 site)

Elected Officials as of January 2021[1,2]

Governor:	Laura Kelly (D)
Senators:	Roger Marshall (R)
	Jerry Moran (R)
Representatives:	
District 1:	Tracy Mann (R)
District 2:	Jacob LaTurner (R)

Kansas: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

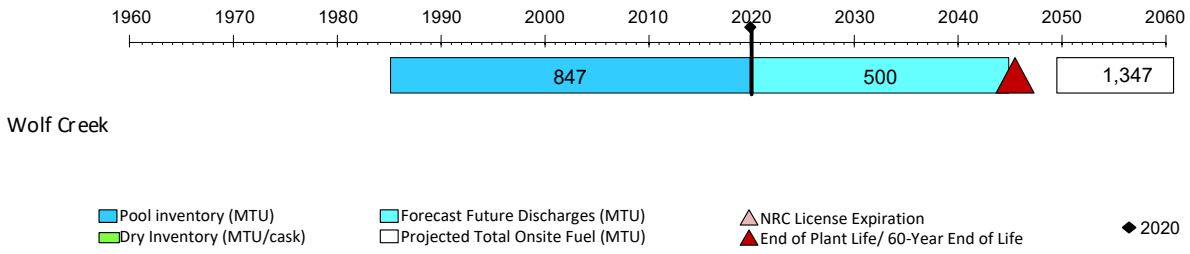
Nuclear 19.6%
Coal 31.0%
Petroleum <0.1%
Gas 5.7%
Hydro 0.1%
Renewable 43.5%
Other 0.0%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Kansas State University	Kansas State University	Tracy Mann (R)	1962-License R-88	R&TRF TRIGA Mark II, 1,250kW/ Operating		
2	Wolf Creek	Wolf Creek Nuclear Operating Co.	Jacob LaTurner (R)	1985-2045	PWR/Operating		1,347

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 0 MTU **Pool: 847 MTU** **Total: 847 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$225.3 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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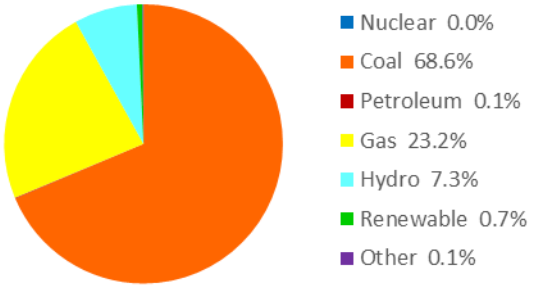
KENTUCKY

Elected Officials as of January 2021[1,2]

Governor:	Andy Beshear (R)
Senators:	Mitch McConnell (R)
	Rand Paul (R)

Kentucky: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

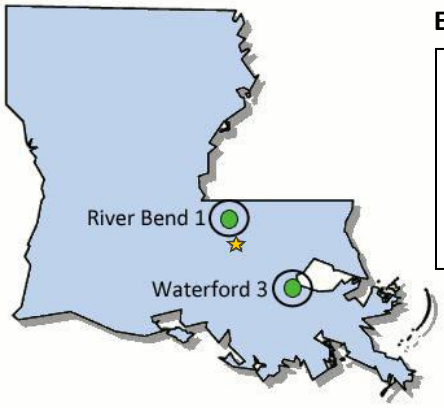


[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

LOUISIANA

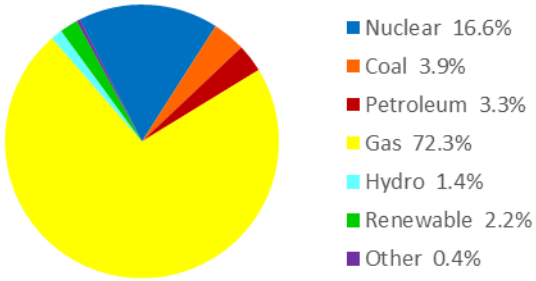


Elected Officials as of January 2021[1,2]

Governor:	John Edwards (D)
Senators:	John N. Kennedy (R)
	Bill Cassidy (R)
Representatives:	
District 2:	Troy A. Carter (D)
District 5:	Julia Letlow (R)

Operating Reactors (2 at 2 sites)
Commercial Dry Storage Sites (2 sites)

Louisiana: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

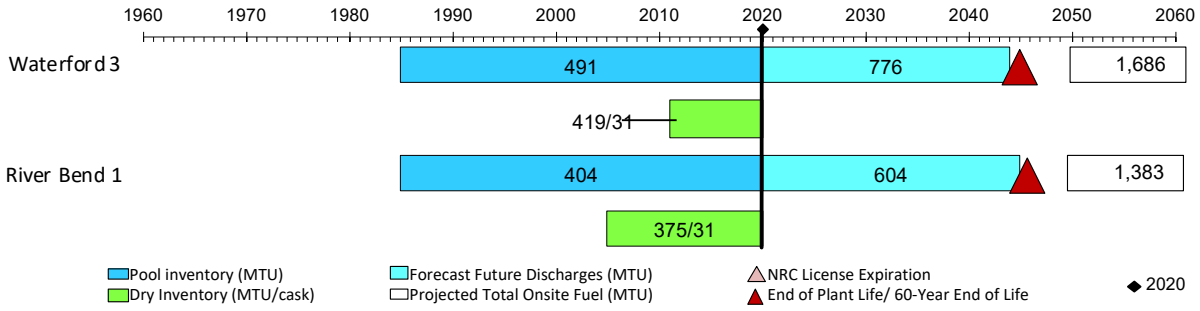


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Waterford 3	Entergy Nuclear Operations, Inc.	Troy A. Carter (D)	1985-2044	PWR/Operating	2011/GL	1,686
5	River Bend 1		Julia Letlow (R)	1985-2045	BWR/Operating	2005/GL	1,383

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 794 MTU in 62 casks **Pool: 895 MTU** **Total: 1,689 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$407.4 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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7 The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and

amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

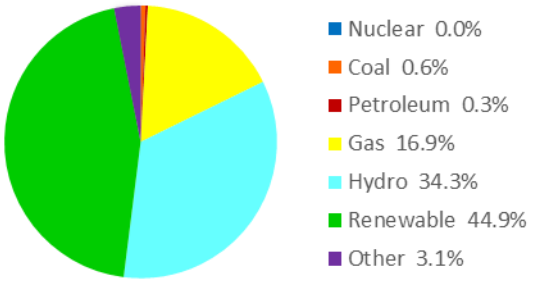
MAINE

Shutdown Reactor (1 at 1 site)
Commercial Dry Storage Site (1 site)

Elected Officials as of January 2021[1,2]

Governor:	Janet Mills (D)
Senators:	Susan Collins (R)
	Angus King (I)
Representative:	
District 1:	Chellie Pingree (D)

Maine: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

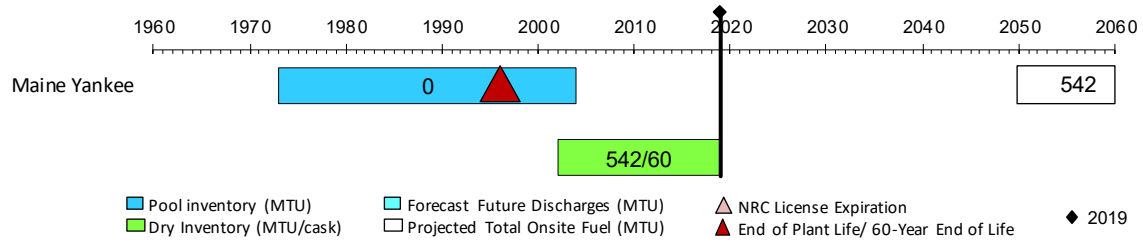


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Maine Yankee	Maine Yankee Atomic Power Co.	Chellie Pingree (D)	1973-1996/ DECON completed	PWR/Shutdown	2002/GL	542

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 542 MTU in 60 casks **Pool: 0 MTU** **Total: 542 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$251.9 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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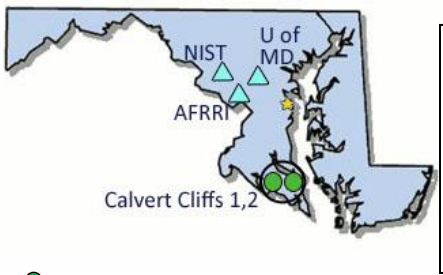
MARYLAND

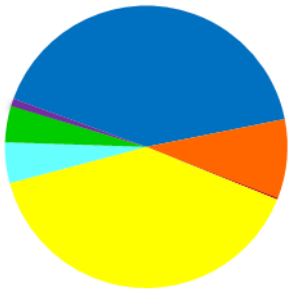


Operating Reactors (2 at 1 site)
Commercial Dry Storage Site (1 site)
Operating Research Reactors (3 at 3 sites)

Elected Officials as of January 2021[1,2]

Governor:	Larry Hogan (R)
Senators:	Chris Van Hollen Jr. (D)
	Benjamin Cardin (D)
Representatives:	
District 5:	Steny H. Hoyer (D)
District 6:	David Trone (D)
District 8:	Jamie Raskin (D)

Maryland: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

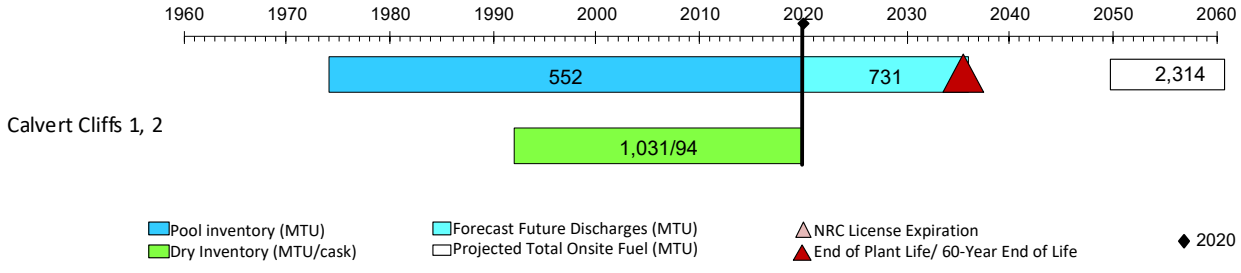


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
5	Calvert Cliffs 1	Calvert Cliffs Nuclear Power Plant inc.[8]	Steny H. Hoyer (D)	1974-2034	PWR/Operating	1992/SL	1,152
	Calvert Cliffs 2			1976-2036	PWR/Operating		1,163
	University of Maryland	University of Maryland		1960-License R-70	R&TRF TRIGA Mark 1, 250kW / Operating		
6	National Institute of Standards and Technology (NIST)	Commerce Department	David Trone (D)	1970-License TR-5	R&TRF Nuclear Test, 20,000kW / Operating		
8	Armed Forces Radiobiology Research Institute (AFRRI)	DOD	Jamie Raskin (D)	1962-License R-84	R&TRF TRIGA Mark F, 1,100kW/ Operating		

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,031 MTU in 94 casks **Pool: 552 MTU** **Total: 1,583 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$426.4 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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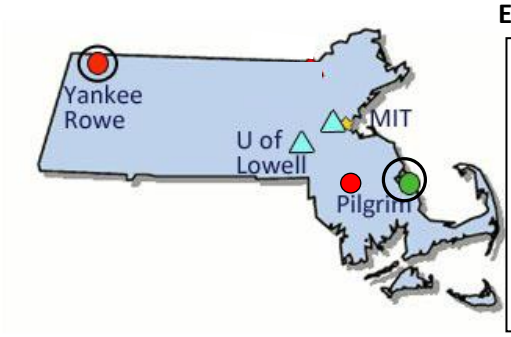
[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] A subsidiary of Exelon.

MASSACHUSETTS



△ Operating Research Reactors (2 at 2 sites)
● Shutdown Reactor (2 at 2 site)
◯ Commercial Dry Storage Site (2 sites)

Elected Officials as of January 2021[1,2]

Governor:	Charlie Baker (R)
Senators:	Elizabeth Warren (D)
	Edward Markey (D)
Representatives:	
District 1:	Richard E. Neal (D)
District 3:	Lori Trahan (D)
District 7:	Ayanna Pressley (D)
District 9:	William Keating (D)

Massachusetts: 2020 Electricity Generation M
(includes utilities and independent power producers)

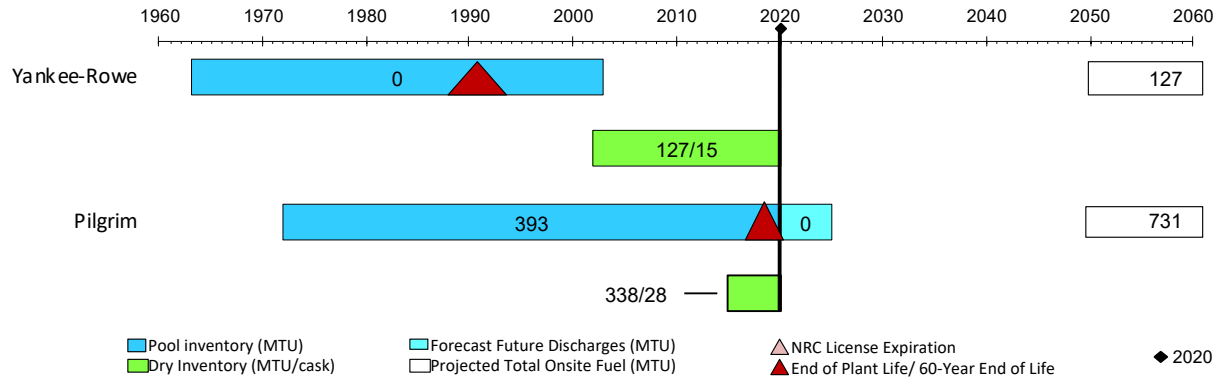
Nuclear 0.0%
Coal 0.0%
Petroleum 0.2%
Gas 76.1%
Hydro 3.2%
Renewable 15.5%
Other 5.0%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Yankee-Rowe	Yankee Atomic Electric Co.	Richard E. Neal (D)	1960-1991/ DECON completed	PWR/Shutdown	2002/GL	127
3	Univ. of Mass.-Lowell	Univ. of Mass.-Lowell	Lori Trahan (D)	1974- License R-125	R&TRF GE Pool, 1,000kW/ Operating		
7	Massachusetts Institute of Technology	Massachusetts Institute of Technology	Ayanna Pressley (D)	1958- License R-37	R&TRF HWR Reflected, 6,000kW/ Operating		
9	Pilgrim	Holtec Pilgrim, LLC[9]	William Keating (D)	1972-2019[8] SAFSTOR	BWR/Early Shutdown	2015/GL	731

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 465 MTU in 43 casks **Pool: 393 MTU** **Total: 858 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$188.4 million paid	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

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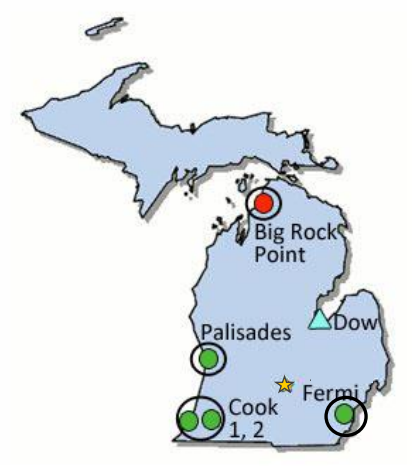
[8] Pilgram ceased operations on May 31, 2019 prior to the end of the extended license.

[9] Ownership changed to Holtec Pilgrim, LLC with Holtec Decommissioning Intenational, LLC as the decommissioning operator. Both are Holtec International subsidiaries.

MICHIGAN

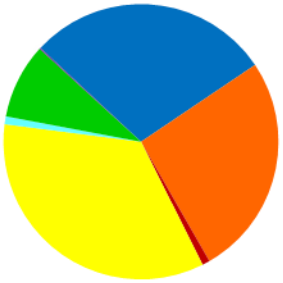


Shutdown Reactor (1 at 1 site)
Operating Reactors (4 at 3 sites)
Commercial Dry Storage Sites (4 sites)
Operating Research Reactor (1 at 1 site)

Elected Officials as of January 2021[1,2]

Governor:	Gretchen Whitmer (D)
Senators:	Debbie Stabenow (D)
	Gary Peters (D)
Representatives:	
District 1:	Jack Bergman(R)
District 4:	John Moolenaar (R)
District 6:	Fred Upton (R)
District 12:	Debbie Dingell (D)

Michigan: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

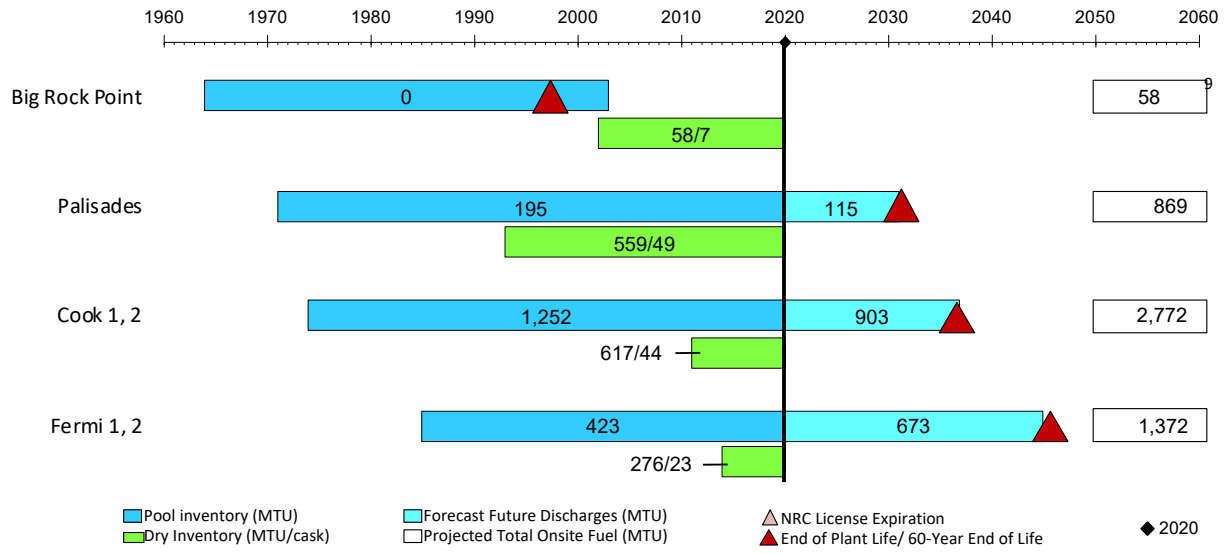


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Big Rock Point	Entergy Nuclear Operations, Inc.	Jack Bergman (R)	1962-1997/ DECON completed	BWR/Shutdown	2002/GL	69[8]
4	Dow Chemical Co.	Dow Chemical Co.	John Moolenaar (R)	1967- License R-108	R&TRF TRIGA Mark 1, 300kW/ Operating		
6	Palisades	Entergy Nuclear Operations, Inc.	Fred Upton (R)	1971-2031	PWR/Operating	1993/GL	869
	Cook 1	American Electric Power Co.		1974-2034	PWR/Operating	2011/GL	1,456
	Cook 2			1977-2037	PWR/Operating		1,316
12	Fermi 1	DTE Electric Co.	Debbie Dingell (D)	1963-1972 SAFSTOR	Fast Breeder Reactor/ Shutdown	No SNF on site	See Note [11]
	Fermi 2			1985-2045	BWR/ Operating	2016/GL	1,372

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,510 MTU in 123 casks **Pool: 1,870 MTU** **Total: 3,380 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$829.0 million paid	**$281.2 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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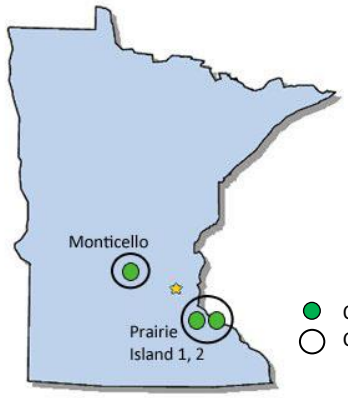
8 Discharges includes 11 MTU transferred to Idaho National Laboratory.

9 SNF in storage does not include 11 MTU transferred to Idaho National Laboratory.

11 Remianing Fermi Unit 1 SNF has been transferred to DOE.

MINNESOTA



Operating Reactors (3 at 2 sites)
Commercial Dry Storage Sites (2 at 2 sites)

Elected Officials as of January 2021[1,2]

Governor:	Tim Walz (D)
Senators:	Amy Klobuchar (D)
	Tina Smith (D)
Representatives:	
District 2:	Angie Craig (D)
District 6:	Tom Emmer (R)

Minnesota: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

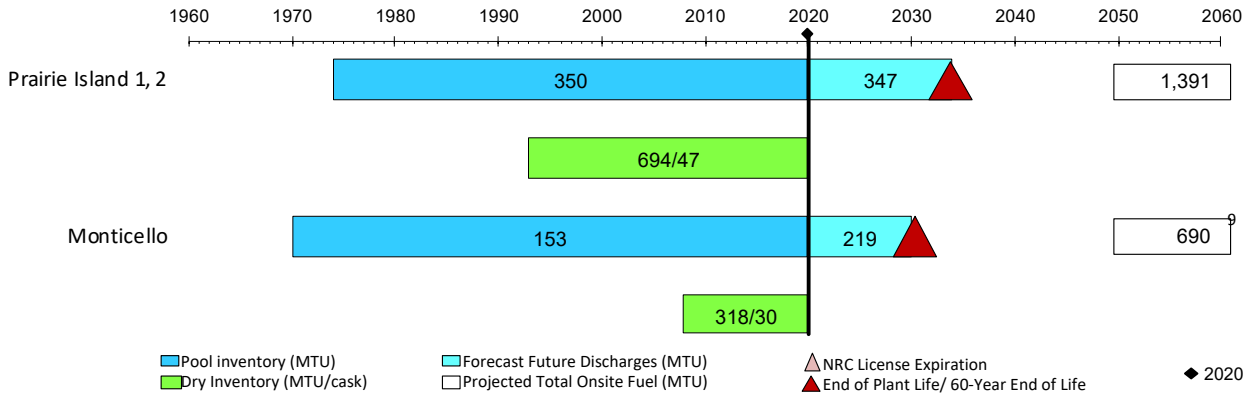
- Nuclear 26.0%
- Coal 24.3%
- Petroleum <0.1%
- Gas 20.0%
- Hydro 2.0%
- Renewable 27.0%
- Other 0.6%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Prairie Island 1	Northern States Power Co. Minnesota[10]	Angie Craig (D)	1974-2033	PWR/Operating	1993/SL	683
	Prairie Island 2			1974-2034	PWR/Operating		708
6	Monticello		Tom Emmer (R)	1970-2030	BWR/Operating	2008/GL	888[8]

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,012 MTU in 77 casks **Pool: 503 MTU** **Total: 1,515 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$449.2 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] Discharges includes 198 MTU transferred to Morris (Illinois).

[9] SNF in storage does not include 198 MTU transferred to Morris (Illinois).

[10] A subsidiary or Xcel Energy

MISSISSIPPI

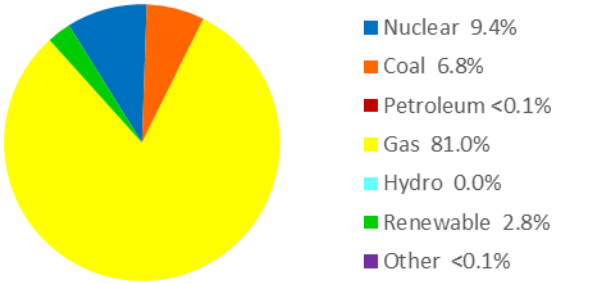
Elected Officials as of January 2021[1,2]

Governor:	Tate Reeves (R)
Senators:	Cindy Hyde-Smith (R)
	Roger Wicker (R)
Representative:	
District 2:	Bennie Thompson (D)

● Operating Reactor (1 at 1 site)
○ Commercial Dry Storage Site (1 site)

Mississippi: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

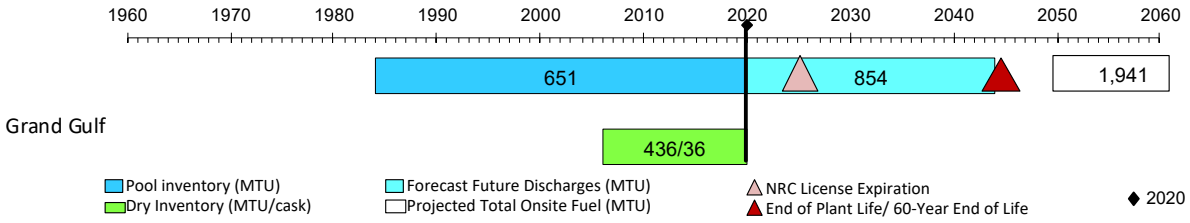


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Grand Gulf	Entergy Operations, Inc.	Bennie Thompson (D)	1984-2044	BWR/Operating	2006/GL	1,941

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 436 MTU in 36 casks **Pool: 651 MTU** **Total: 1.087 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$250.4 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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MISSOURI

Elected Officials as of January 2021[1,2]

Governor:	Mike Parson (R)
Senators:	Joshua Hawley (R)
	Roy Blunt (R)
Representatives:	
District 3:	Blaine Luetkemeyer (R)
District 4:	Vicky Hartzler (R)
District 8:	Jason Smith (R)

○ Commercial Dry Storage Site (1 at 1 site)
● Operating Reactor (1 at 1 site)
△ Operating Research Reactors (2 at 2 sites)

Missouri: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

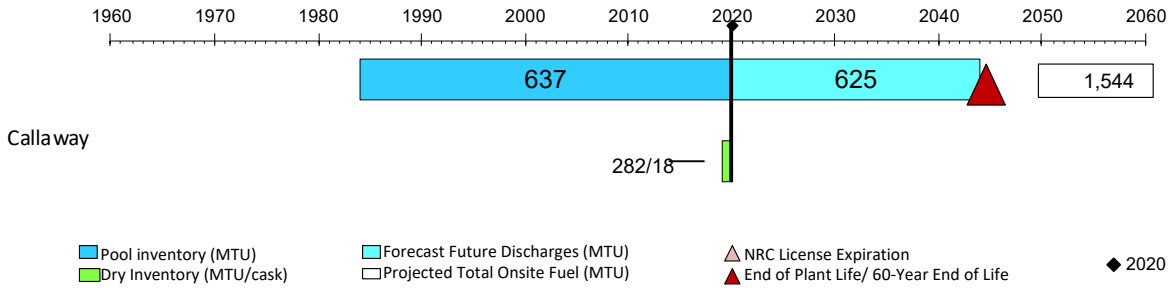
- Nuclear 11.6%
- Coal 69.1%
- Petroleum 0.1%
- Gas 11.1%
- Hydro 3.0%
- Renewable 5.1%
- Other <0.1%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
3	Callaway	Ameren Corp.	Blaine Luetkemeyer (R)	1984-2044	PWR/Operating	2015/GL	1,544
4	University of Missouri - Columbia	University of Missouri System	Vicky Hartzler (R)	1966- License R-103	R&TRF Tank, 10,000kW/ Operating		
8	Missouri University of Science and Technology	University of Missouri	Jason Smith (R)	1961- License R-79	R&TRF Pool, 200kW/ Operating		

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 282 MTU in 18 casks **Pool: 637 MTU** **Total: 919 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$243.1 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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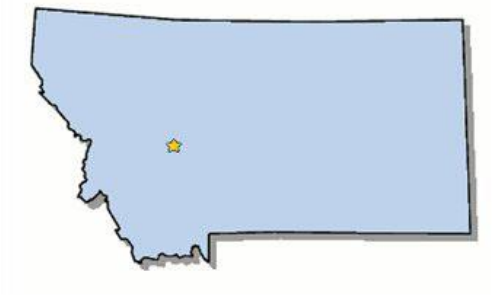
[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

MONTANA

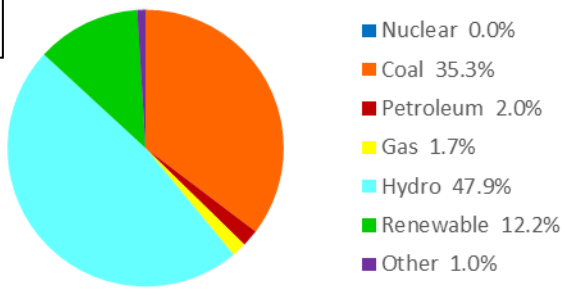


Elected Officials as of January 2021[1,2]

Governor:	Greg Gianforte (R)
Senators:	Jon Tester (D)
	Steve Daines (R)

Montana: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed J January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

NEBRASKA

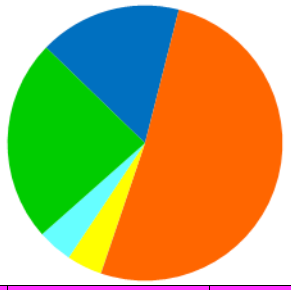
Shutdown Reactor (1 at 1 site)
Operating Reactors (1 at 1 site)
Commercial Dry Storage Sites (2 sites)

Elected Officials as of January 2021[1,2]

Governor:	Pete Ricketts (R)
Senators:	Deb Fischer (R)
	Benjamin Sasse (R)
Representatives:	
District 1:	Jeff Fortenberry (R)
District 3:	Adrian Smith (R)

Nebraska: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



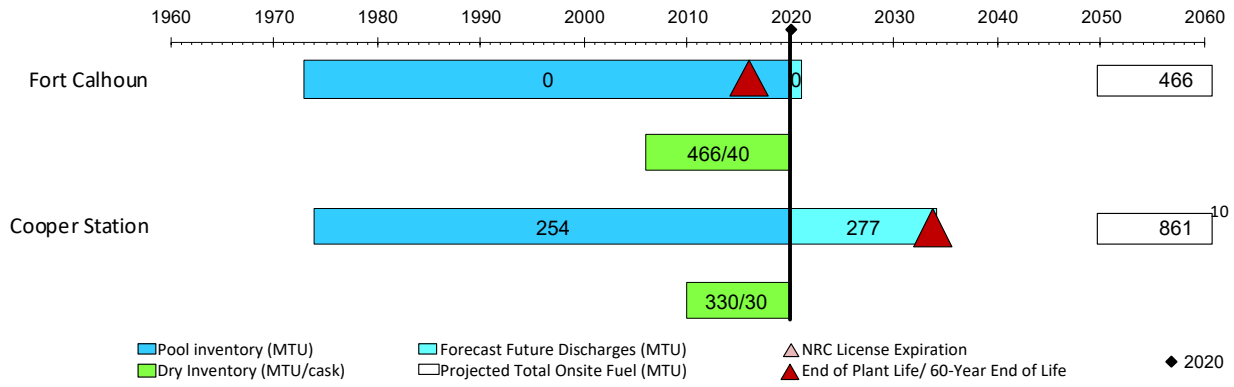
Nuclear 16.7%
Coal 51.2%
Petroleum <0.1%
Gas 4.2%
Hydro 4.1%
Renewable 23.8%
Other 0.0%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Fort Calhoun	Omaha Public Power District[8]	Jeff Fortenberry (R)	1973-2016 Shutdown	SAFSTORE/Early Shutdown	2006/GL	466
3	Cooper Station	Nebraska Public Power District[8]	Adrian Smith (R)	1974-2034	BWR/Operating	2010/GL	1,059[9]

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 796 MTU in 70 casks **Pool: 254 MTU** **Total: 1,050 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$300.2 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

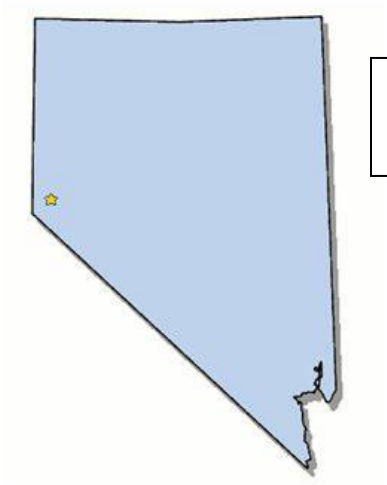
[8] Operated by Exelon Nuclear Partners.

[9] Support services provided by Entergy Nuclear Nebraska through 2029.

[9] Discharges includes 198 MTU transferred to Morris (Illinois).

[10] SNF in storage does not include 198 MTU transferred to Morris (Illinois).

NEVADA

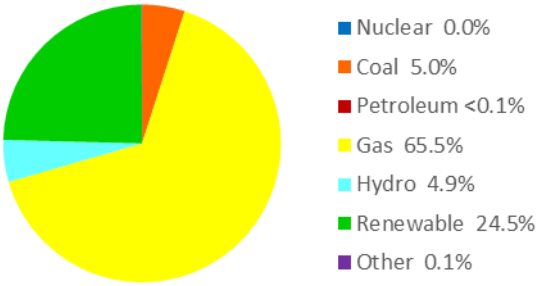


Elected Officials as of January 2021[1,2]

Governor:	Steve Sisolak (R)
Senators:	Catherine Cortez Masto (D)
	Jacky Rosen (D)

Nevada: 2020Electricity Generation Mix[3]

(includes utilities and independent power producers)



1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

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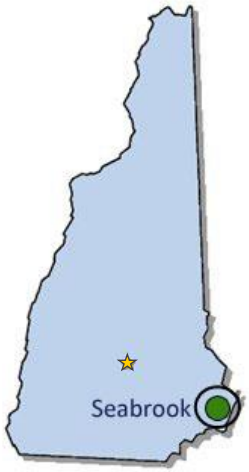
NEW HAMPSHIRE

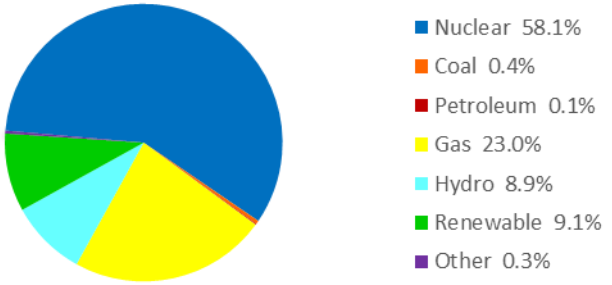


Elected Officials as of January 2021[1,2]

Governor:	Chris Sununu (R)
Senators:	Jeanne Shaheen (D)
	Margaret Hassan (D)
Representative:	
District 1:	Chris Pappas (D)

Operating Reactor (1 at 1 site)
Commercial Dry Storage Site (1 site)

New Hampshire: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

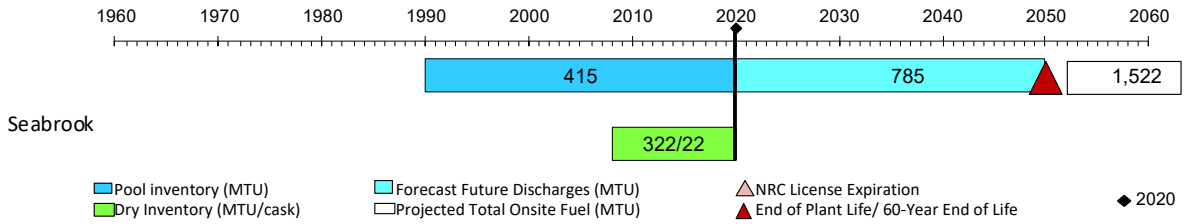


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Seabrook	NextEra Energy Seabrook, LLC	Chris Pappas (D)	1990-2050	PWR/Operating	2008/GL	1,522

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 322 MTU in 22 casks **Pool: 415 MTU** **Total: 737 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$201.2 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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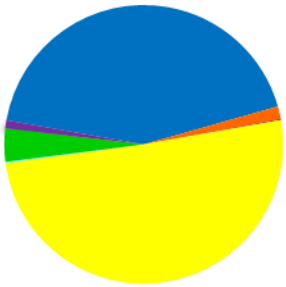
NEW JERSEY

Shutdown Reactor (1 at 1 site)
Operating Reactors (3 at 1 site)
Commercial Dry Storage Sites (2 sites)

Elected Officials as of January 2021[1,2]

Governor:	Phil Murphy (D)
Senators:	Robert Menendez (D)
	Cory Booker (D)
Representatives:	
District 2:	Jefferson Van Drew (D)
District 3:	Andy Kim (D)

New Jersey: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

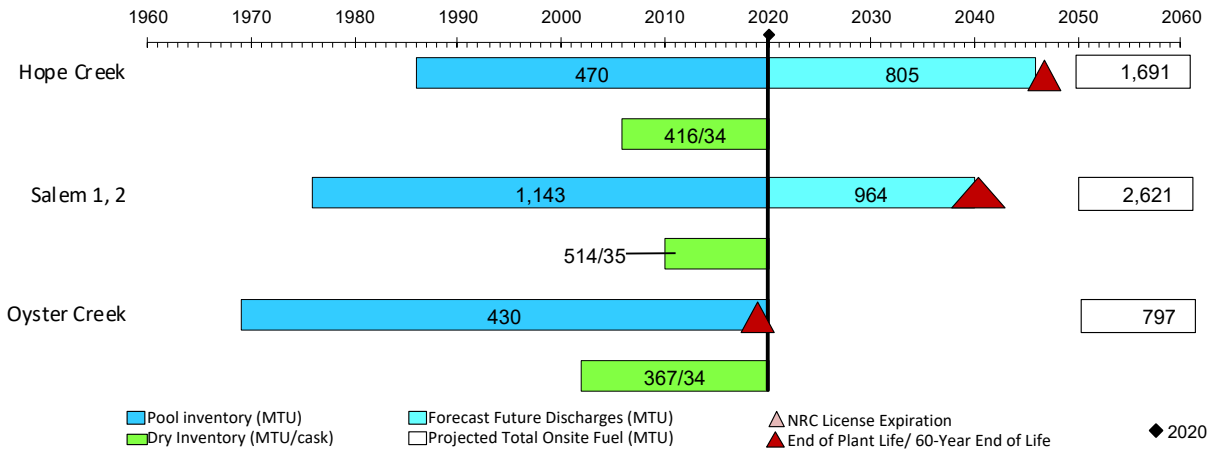


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Hope Creek	PSEG Nuclear LLC	Jefferson Van Drew (D)	1986-2046	BWR/Operating	2006/GL	1,691
	Salem 1			1976-2036	PWR/Operating	2010/GL	1,301
	Salem 2			1981-2040	PWR/Operating		1,320
3	Oyster Creek	Oyster Creek Environmental Protection[8].	Andy Kim (D)	1991-2018 SAFSTOR	BWR/ Early Shutdown[5]	2002/GL	797

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,297 MTU in 103 casks **Pool: 2,043 MTU** **Total: 3,340 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$769.6 million paid	**$185.3 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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[8] A Holtec subsidiary.

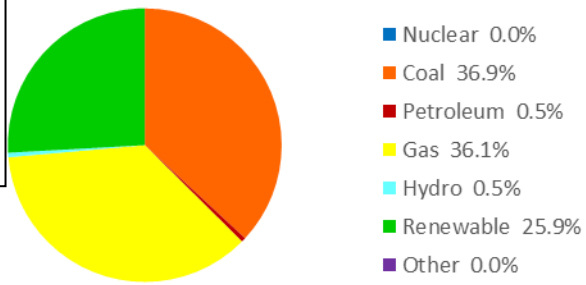
NEW MEXICO

Elected Officials as of January 2021[1,2]

Governor:	Michelle Lujan Grisham (D)
Senators:	Tom Udall (D)
	Ben R. Luján (D)
Representatives:	
District 1:	Debra Haaland (D)
District 2:	Yvette Herrell (R)
District 3:	Teresa Leger Fernandez (D)

New Mexico: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



△ Operating Research Reactors (2 at 2 sites)
▽ Sandia National Laboratory
▽ Surplus Plutonium at Los Alamos National Laboratory
△ DOE Research Reactor

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected
1	University of New Mexico	Univ. of New Mexico	Debra Haaland (D)	1966- License R-102	R&TRF AGN-201M #112, 0.005kW/ Operating		
	Sandia National Lab	DOE[4]		None	Various		
	SNL: Annular Core Research Reactor (ACRR)			1979-	Test reactor		
2	White Sands Missile Range	U.S. Air Force[4]	Yvette Herrell (R)	None	R&TRF FBR/ Operating		
3	Los Alamos National Lab	DOE[4]	Teresa Leger Fernandez (D)	None	Various		

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

4 DOE Regulated Facilities.

NEW YORK

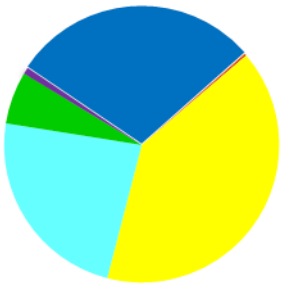
- Shutdown Reactor (2 at 1 site)
- Operating Reactors (5 at 4 sites)
- Commercial Dry Storage Sites (4 sites)
- Operating Research Reactor (1 at 1 site)
- Commercial HLW at West Valley
- Brookhaven National Laboratory

Elected Officials as of September 2021[1,2]

Governor:	Kathy Hochul (D)
Senators:	Chuck Schumer (D)
	Kirsten Gillibrand (D)
Representatives:	
District 1:	Lee Zeldin (R)
District 17:	Mondaire Jones (D)
District 20:	Paul D. Tonko (D)
District 23:	Tom Reed (R)
District 24:	John Katko (R)
District 26:	Brian Higgins (D)

New York: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



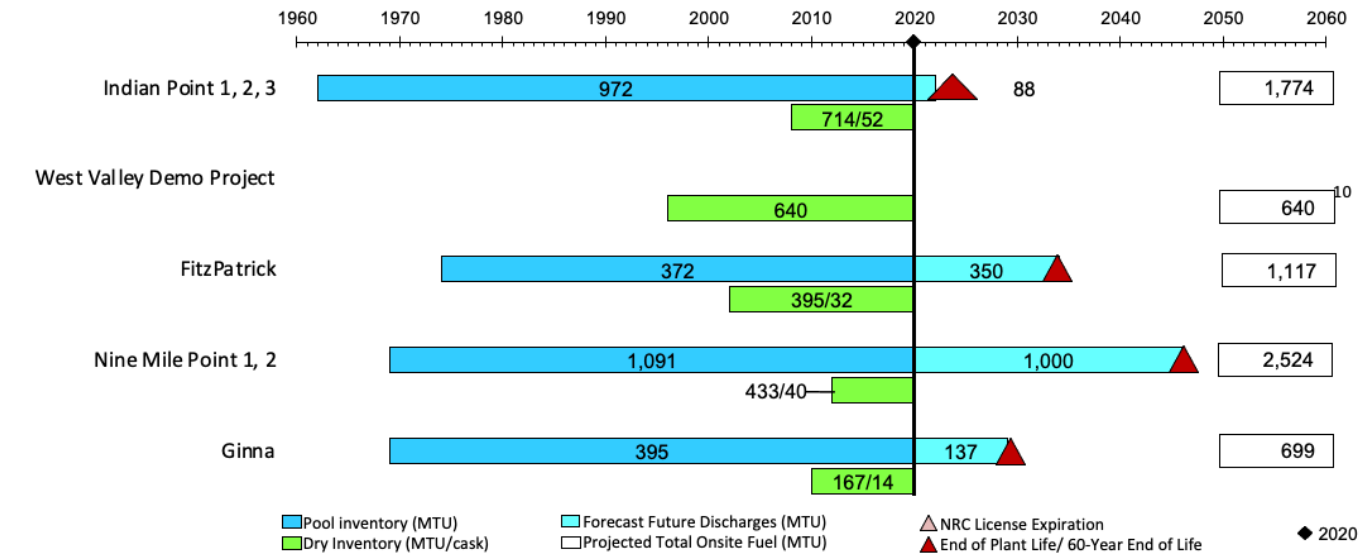
- Nuclear 29.0%
- Coal 0.1%
- Petroleum 0.1%
- Gas 40.3%
- Hydro 23.5%
- Renewable 6.2%
- Other 0.8%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Brookhaven National Lab	DOE[8]	Lee Zeldin (R)	None	Various		
17	Indian Point 1	Entergy Nuclear Operations, Inc. Transfer to Holtec Decommissioning International is pending	Mondaire Jones (D)	1962-1974/ SAFSTOR	PWR/Shutdown	2008/GL	31
	Indian Point 2			1973-2024[9]	PWR/Shutdown		899
	Indian Point 3			1975-2025[9]	PWR/ Operating[15]		844
20	Rensselaer Polytechnic Institute (RPI)	Rensselaer Polytechnic Institute	Paul D. Tonko (D)	1964- License CX-22	R&TRF Critical Assembly, 0.1kW / Operating		
23	West Valley Demonstration Project	New York State Energy Research and Development Authority (NYSERDA)	Tom Reed II (R)	1966-1972/ DECON	Reprocessing Plant/Shutdown		See Note [10]
24	Fitzpatrick	Exelon Generation Company, LLC	John Katko (R)	1974-2034	BWR/Operating	2002/GL	1,117
	Nine Mile Point 1	Nine Mile Point Nuclear Station, LLC[14]		1974-2029	BWR/Operating	2012/GL	889
	Nine Mile Point 2			1987-2046	BWR/Operating		1,635
	Ginna	R. E. Ginna Nuclear Power plant., LLC[14]		1969-2029	PWR/Operating	2010/GL	715[11]

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,709 MTU in 138 casks **Pool: 2,830 MTU** **Total: 4,539 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$1,011.8 million paid[13]	**$536.6 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed September 11, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] DOE Regulated Facility.

[9] License was extended to the indicated dates which was not a full 20 year extension.

[10] About 640 MTU were reprocessed producing about 2,500 m^3 of liquid high-level waste (HLW). The liquid was vitrified between 1996 and 2001 producing 278 HLW canisters. These canisers have been moved to 56 canisters in concrete vented overpacks, similar to SNF storage, to allow facility decomissionng to continue.

[11] Discharges includes 15 MTU transferred to the Idaho National Lab.

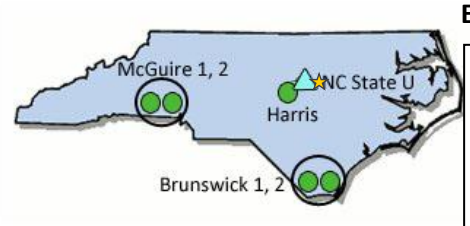
[12] SNF in storage does not include 15 MTU transferred to the Idaho National Lab.

[13] Includes One-Time fee paid by Nuclear Fuel Services (NFS) for West Valley.

[14] An Exelon subsidiary.

[15] Indian Point Unit 3 shutdown on 4/30/2021, after the datadate for this report..

NORTH CAROLINA

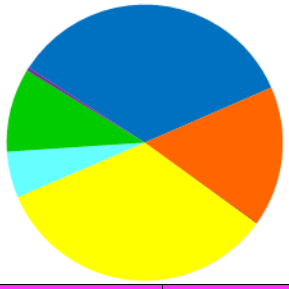


Operating Reactors (5 at 3 sites)
Commercial Dry Storage Sites (2 sites)
Operating Research Reactor (1 at 1 site)

Elected Officials as of January 2021[1,2]

Governor:	Roy Cooper (D)
Senators:	Richard Burr (R)
	Thom Tillis (R)
Representatives:	
District 4:	David Price (D)
District 7:	David Rouzer (R)
District 9:	Dan Bishop (R)

North Carolina: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)



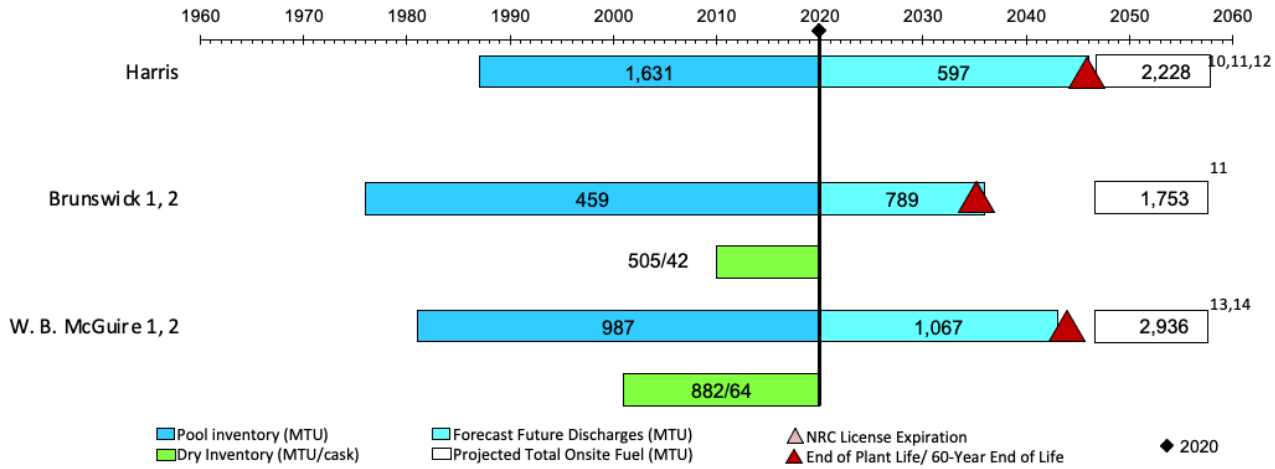
Nuclear 34.3%
Coal 16.4%
Petroleum 0.1%
Gas 33.6%
Hydro 5.4%
Renewable 9.8%
Other 0.4%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
4	Harris	Duke Energy Progress, LLC	David Price (D)	1986-2046	PWR/Operating		12248
7	Brunswick 1		David Rouzer (R)	1976-2036	BWR/Operating	2010/GL	1,214[9]
	Brunswick 2			1974-2034	BWR/Operating		1,191
4	North Carolina State University	North Carolina State University	David Price (R)	1972-License R-120	R&TRF Pulstar, 1,000kW/ Operating		
9	W. B. McGuire 1	Duke Energy Carolinas, LLC	Dan Bishop (R)	1981-2041	PWR/ Operating	2001/GL	1,394[10]
	W. B. McGuire 2			1983-2043	PWR/Operating		1,402

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,387 MTU in 106 casks **Pool: 3,077 MTU** **Total: 4,464 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$1,034.6 million paid	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] Total Harris Discharges excludes 784 MTU transferred from Brunswick and 219 MTU transferred from Robinson (South Carolina)

[9] Total Brunswick 1 and 2 projected discharged fuel includes 784 MTU that was transferred from Brunswick to Harris and is no longer at the site.

[10] Total McGuire 1 and 2 projected discharged fuel excludes 140 MTU that was transferred from Oconee (South Carolina).

[11] SNF in storage includes the transfer of 784 MTU in from Brunswick and 219 MTU in from Robinson 2 (South Carolina).

[12] SNF was transferred between Harris, Brunswick, and Robinson (South Carolina). The following table provides the SNF inventories at Harris and Brunswick, including transfers. Forecasted future discharges are not included. Transfer data is from Table 2-4.

Onsite SNF at Harris (MTU) as of 12/31/2020		Onsite SNF at Brunswick (MTU) as of 12/31/2020	
Fuel discharges onsite as of 12/31/2017	566	Fuel discharges onsite as of 12/31/2017	1490
Forecast fuel discharges, 1/1/2018 to 12/31/2020	62	Forecast fuel discharges, 1/1/2018 to 12/31/2020	127
SNF transferred in from Robinson 2	219	SNF transferred in from Robinson 2	132
SNF transferred in from Brunswick	784	SNF transferred out to Harris	-784
Total Forecasted SNF Onsite	**1,631**	**Total Forecasted SNF Onsite**	**965**

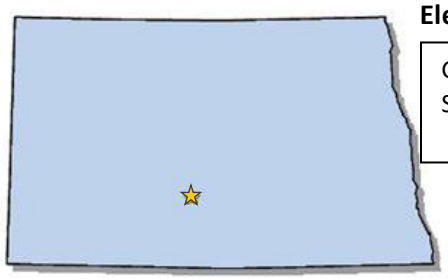
[13] Reflects the transfer of 784 MTU out to Harris and 132 MTU in from Robinson 2 (South Carolina).

[14] Reflects the transfer of 140 MTU in from Oconee (South Carolina).

[15] SNF was transferred between W. B. McGuire (North Carolina) and Oconee (South Carolina). The following table provides the SNF inventories at McGuire, including transfers. Forecasted future discharges are not included. Transfer data is from Table 2-4.

Onsite SNF at McGuire as of 12/31/2020	
Fuel discharges onsite as of 12/31/2017	1597
Forecast fuel discharges, 1/1/2018 to 12/31/2020	132
SNF transferred in from Oconee	140
Total Forecasted SNF Onsite	**1,869**

NORTH DAKOTA

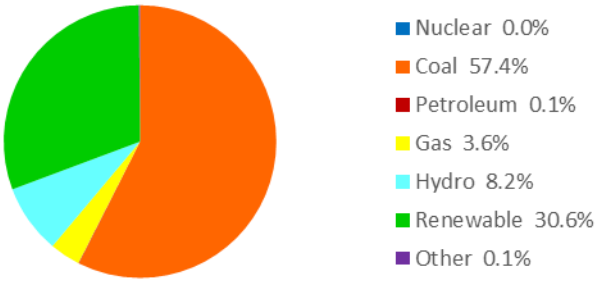


Elected Officials as of January 2021[1,2]

Governor:	Doug Burgum (R)
Senators:	John Hoeven (R)
	Kevin Cramer (R)

North Dakota: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

OHIO

Elected Officials as of January 2021[1,2]

Governor:	Mike DeWine (R)
Senators:	Sherrod Brown (D)
	Robert Portman (R)
Representatives:	
District 3:	Joyce Beatty (D)
District 9:	Marcy Kaptur (D)
District 14:	David Joyce (R)

Operating Reactors (2 at 2 sites)
Commercial Dry Storage Sites (2 sites)
Operating Research Reactor (1 at 1 site)

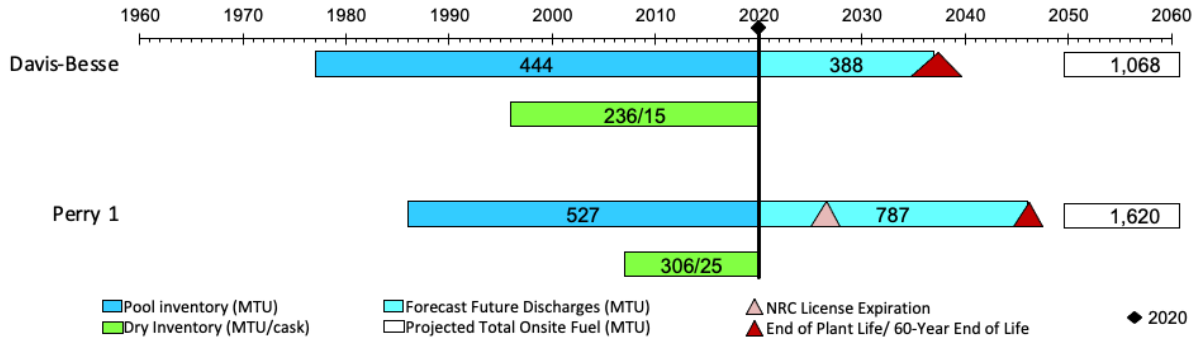
Ohio: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
3	Ohio State University	Ohio State University	Joyce Beatty (D)	1961-License R-75	R&TRF Pool, 500kW/ Operating		
9	Davis-Besse	Energy Harbor Nuclear Corp.	Marcy Kaptur (D)	1977-2037	PWR/Operating	1996/GL	1,068
14	Perry 1		David Joyce (R)	1986-2026	BWR/Operating	2007/GL	1,620

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 542 MTU in 40 casks **Pool: 971 MTU** **Total: 1,513 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$381.5 million paid	**$34.7 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

4 Forecast SNF discharges from individual reactors from the Reference Scenario in Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 in Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

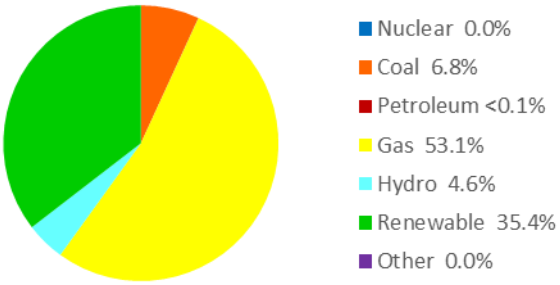
OKLAHOMA

Elected Officials as of January 2021[1,2]

Governor:	Kevin Stitt (R)
Senators:	James Inhofe (R)
	James Lankford (R)

Oklahoma: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

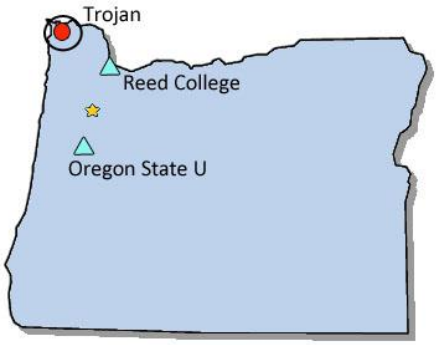


1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

OREGON

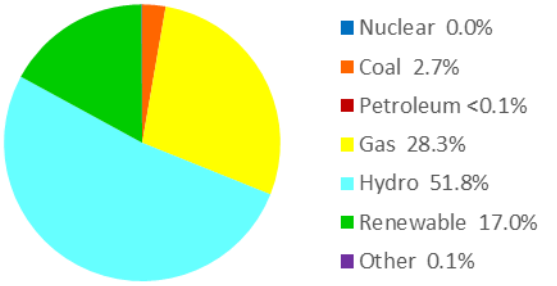


Elected Officials as of January 2021[1,2]

Governor:	Kate Brown (D)
Senators:	Ron Wyden (D)
	Jeff Merkley (D)
Representatives:	
District 1:	Suzanne Bonamici (D)
District 3:	Earl Blumenauer (D)
District 4:	Peter DeFazio (D)

Shutdown Reactor (1 at 1 site)
Commercial Dry Storage Site (1 site)
Operating Research Reactors (2 at 2 sites)

Oregon: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

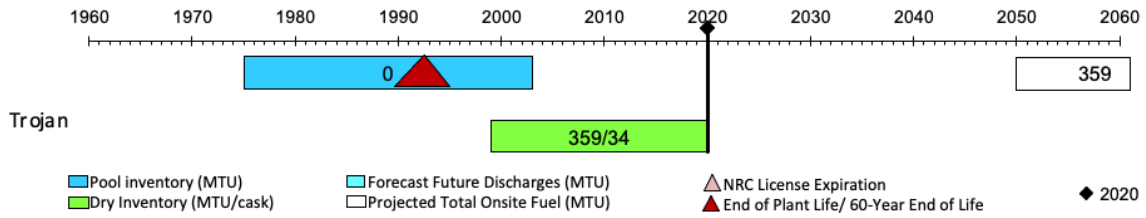


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Trojan	Portland General Electric Corp.	Suzanne Bonamici (D)	1975-1992 DECON Completed	PWR/ DECON Completed	1999/SL	359
3	Reed College	Reed College	Earl Blumenauer (D)	1968- License R-112	R&TRF TRIGA Mark I, 250kW/ Operating		
4	Oregon State University	Oregon State University	Peter DeFazio (D)	1967- License R-106	R&TRF TRIGA Mark II, 1,100kW/ Operating		

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 359 MTU in 34 casks **Pool: 0 MTU** **Total: 359 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$75.5 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

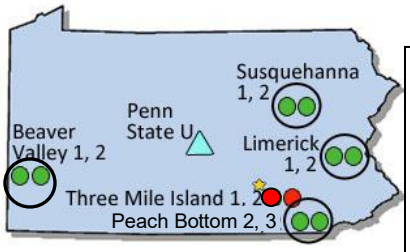
4 Forecast SNF discharges from individual reactors from the Reference Scenario in Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 in Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

PENNSYLVANIA

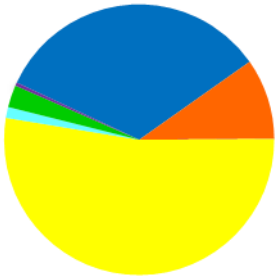


Shutdown Reactor (2 at 1 site)
Operating Reactors (8 at 4 sites)
Commercial Dry Storage Sites (4 sites)
Operating Research Reactor (1 at 1 site)

Elected Officials as of January 2021[1,2]

Governor:	Tom Wolf (D)
Senators:	Robert Casey, Jr. (D)
	Patrick Toomey (R)
Representatives:	
District 4:	Madeleine Dean (D)
District 5:	Mary Scanlon (D)
District 6:	Chrissy Houlahan (D)
District 11:	Lloyd Smucker (R)
District 12:	Fred Keller (R)
District 15:	Glenn Thompson (R)

Pennsylvania: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

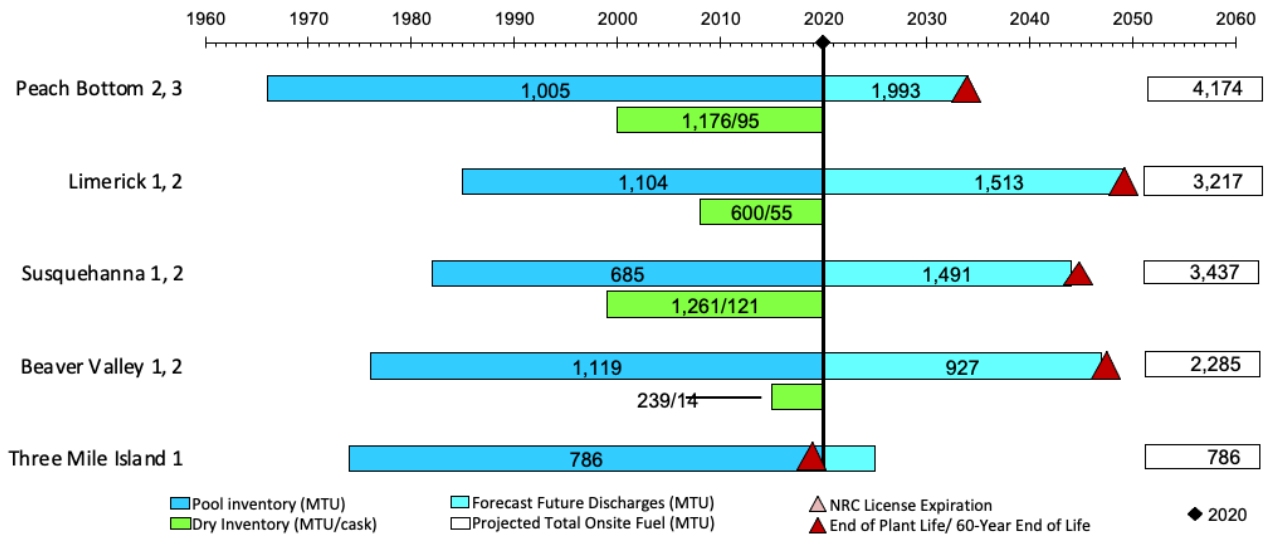


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
4	Peach Bottom 1	Exelon Generation Co., LLC	Madeleine Dean (D)	1967-1974/ SAFSTOR	BWR/Shutdown	No SNF on Site	
	Peach Bottom 2			1973-2053[11]	BWR/Operating	2000/GL	2,087[8]
	Peach Bottom 3			1974-2054[11]	BWR/Operating		2,087
5	Pennsylvania State University	Pennsylvania State University	Mary Scanlon (D)	1955- License R-2	R&TRF TRIGA BNR/ Operating		
6	Limerick 1	Exelon Generation Co., LLC	Chrissy Houlahan (D)	1985-2044	BWR/Operating	2008/GL	1,588
	Limerick 2			1989-2049	BWR/Operating		1,629
11	Susquehanna 1	Susquehanna Nuclear, LLC[12]	Lloyd Smucker (R)	1982-2042	BWR/Operating	1999/GL	1,701
	Susquehanna 2			1984-2044	BWR/Operating		1,736
12	Beaver Valley 1	Energy Harbor Nuclear Corp.	Fred Keller (R)	1976-2036	PWR/Operating	2015/GL	1,104
	Beaver Valley 2			1987-2047	PWR/Operating		1,181
15	Three Mile Island 1	Exelon Generation Co., LLC	Glenn Thompson (R)	1974-2019	PWR/Shutdown		786
	Three Mile Island 2	TMI-2 Solutions		1978-1979[9] SAFSTORE	PWR//Shutdown	No SNF on Site	See Note[10]

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 3,276 MTU in 285 casks **Pool: 4,699 MTU** **Total: 7,975 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$1,946.9 million paid	**$94.7 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario in Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 in Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A "one-time fee" was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] Includes 0.38 MTU transferred to Idaho National Laboratory.

[9] Unit 2 in post-defueling monitored storage mode until both units are ready for decommissioning.

[10] Three Mile Island Unit 2 fuel shipped to Idaho National Laboratory.

[11] Date include the "subsequent" or second 20 year license renewal grated March 5, 2020.

[12] A subsidiary of Talen Energy.

RHODE ISLAND

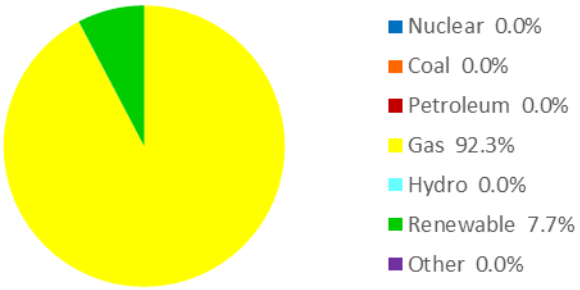
Elected Officials as of January 2021[1,2]

Governor:	Dan McKee (D)
Senators:	John Reed (D)
	Sheldon Whitehouse (D)
Representative:	
District 2:	James Langevin (D)

△ Operating Research Reactor (1 at 1 site)

Rhode Island: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



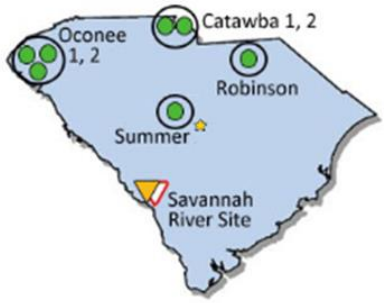
Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected
2	RI Atomic Energy Commission	RI Atomic Energy Commission	James Langevin (D)	1964- License R-95	R&TRF GE Pool, 2,000kW / Operating		

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

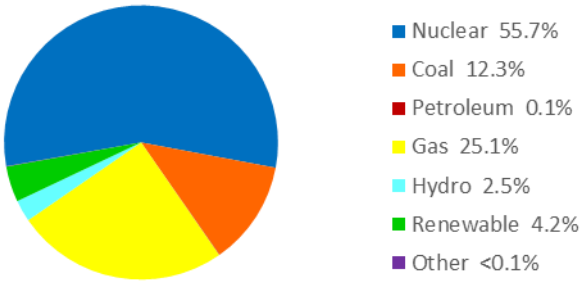
SOUTH CAROLINA



Elected Officials as of January 2021[1,2]

Governor:	Henry McMaster (R)
Senators:	Lindsey Graham (R)
	Tim Scott (R)
Representatives:	
District 2:	Joe Wilson (R)
District 3:	Jeff Duncan (R)
District 5:	Ralph Norman (R)
District 7:	Tom Rice (R)

South Carolina: 2020 Electricity Generation Mix
(includes utilities and independent power producers)



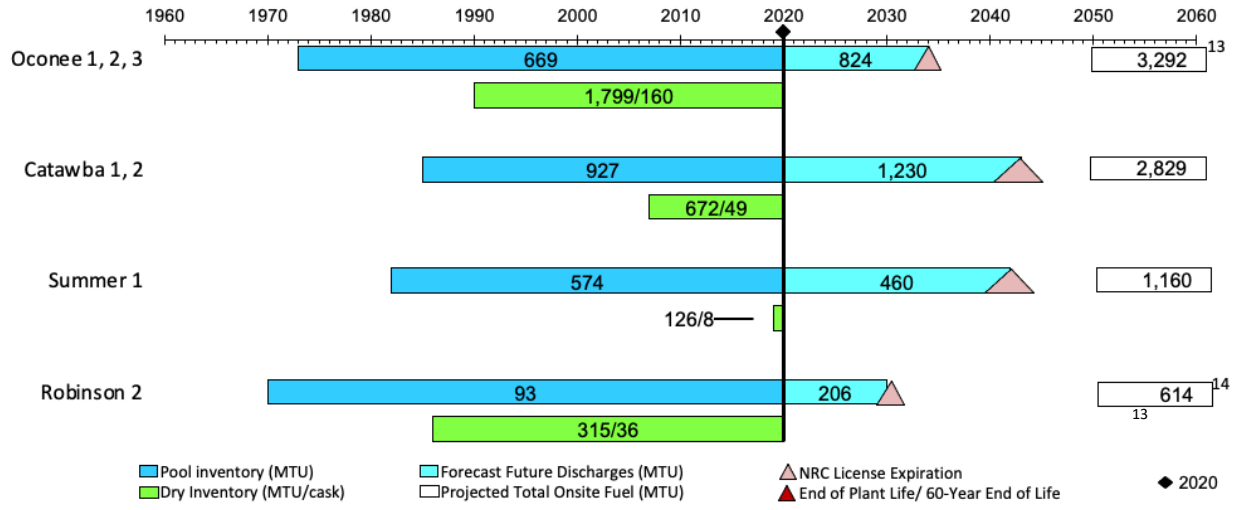
- Operating Reactors (7 at 4 sites)
- Commercial Dry Storage Sites (4 sites)
- DOE owned SNF and Reprocessing Waste at Savannah River Site
- Surplus Plutonium at Savannah River Site

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	Savannah River Site	DOE[8]	Joe Wilson (R)		Various		See Note [15]
3	Oconee 1	Duke Energy Carolinas	Jeff Duncan (R)	1973-2033	PWR/Operating	1990/SL 1999/GL	1,137[9]
	Oconee 2			1973-2033	PWR/Operating		1,134[9]
	Oconee 3			1974-2034	PWR/Operating		1,161[9]
5	Catawba 1		Ralph Norman (R)	1985-2043	PWR/Operating	2007/GL	1,439
	Catawba 2			1986-2043	PWR/Operating		1,390
	Summer 1	Dominion Southeast Energy		1982-2042	PWR/Operating	2016/GL	1,160
7	Robinson 2	Duke Energy Progress, LLC	Tom Rice (R)	1970-2030	PWR/Operating	1986/SL 2005/GL	966[10-12]

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 2,912 MTU in 253 casks **Pool: 2,263 MTU** **Total: 5,175 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$1,498.7 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

4 Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

5 State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

6 Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

7 The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

8 DOE Regulated Facility.

9 Total Oconee 1,2, and 3 total projected discharged fuel includes 140 MT transferred to McGuire and is no longer at the site.

10 Discharges includes 0.44 MTU transferred to Idaho National Laboratory.

11 Discharges includes 132 MTU transferred to Brunswick (North Carolina).

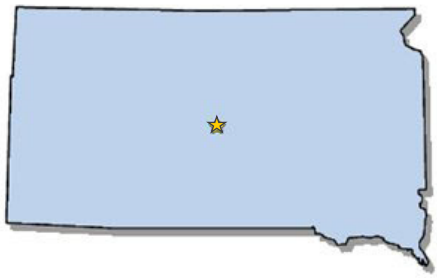
12 Discharges includes 219 MTU transferred to Harris (North Carolina).

13 SNF in storage reflects the transfer of 140 MTU to McGuire (North Carolina).

14 SNF in storage reflects the transfer of 132 MTU to Brunswick (North Carolina) and 219 MTU to Harris (North Carolina).

15 SRS has approximately 29 MT from DOE sources.

SOUTH DAKOTA

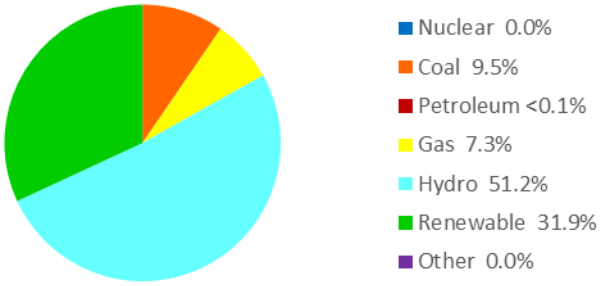


Elected Officials as of January 2021[1,2]

Governor:	Kristi Noem (R)
Senators:	Mike Rounds (R)
	John Thune (R)

South Dakota: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



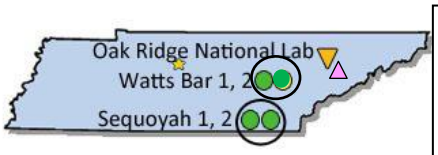
1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

TENNESSEE

Elected Officials as of January 2021[1,2]

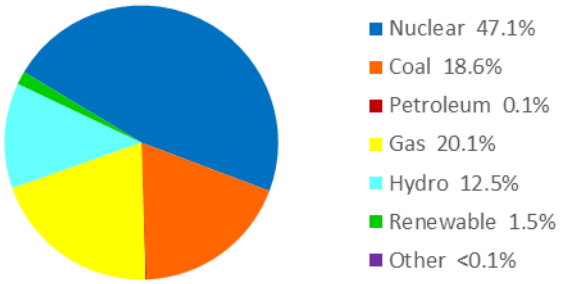


- Operating Reactors (4 at 2 sites)
- Commercial Dry Storage Site (1 site)
- DOE owned SNF at Oak Ridge
- DOE Research Reactor

Governor:	Bill Lee (R)
Senators:	Bill Hagerty (R)
	Marsha Blackburn (R)
Representatives:	
District 3:	Chuck Fleischmann (R)
District 4:	Scott DesJarlais (R)

Tennessee: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

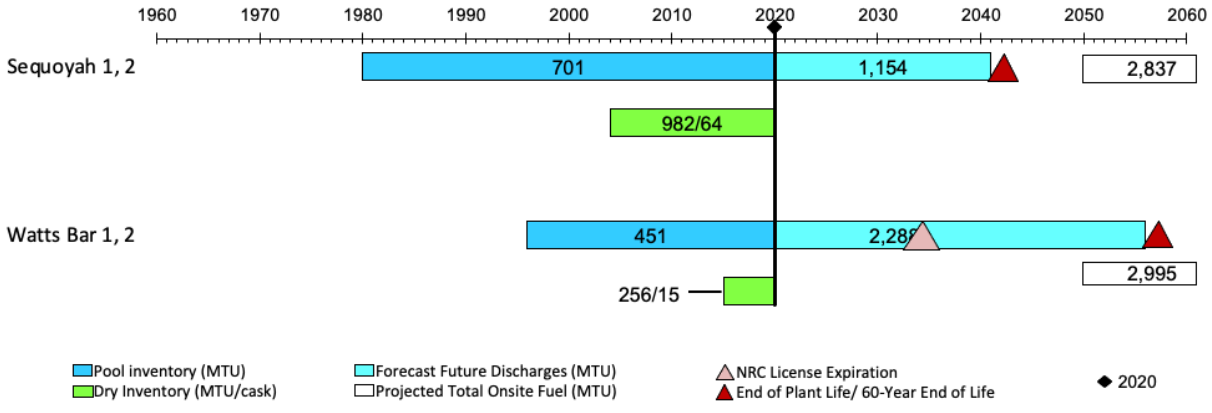


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
3	Sequoyah 1	Tennessee Valley Authority	Chuck Fleischmann (R)	1980-2040	PWR/Operating	2004/GL	1,410
	Sequoyah 2			1981-2041	PWR/Operating		1,427
	Oak Ridge National Lab	DOE[8]		None	Various		
	ORNL: High Flux Isotope Reactor (HFIR)			mid-1960s	Test reactor		See Note [9]
4	Watts Bar 1	Tennessee Valley Authority	Scott DesJarlais (R)	1996-2035	PWR/Operating	2016/GL	1,604
	Watts Bar 2			2015-2055	PWR/Operating		1,391

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,238 MTU in 79 casks **Pool: 1,152 MTU** **Total: 2,390 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$596.9 million paid	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

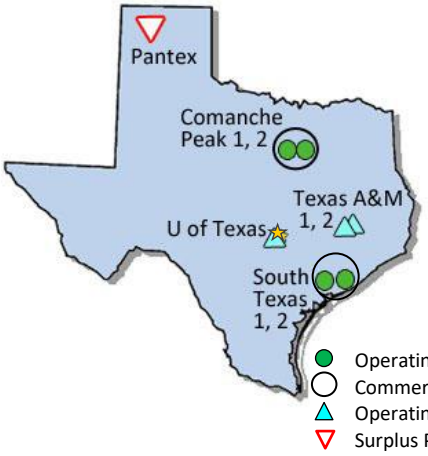
[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] DOE Regulated Facility.

[9] DOE Operates the High-Flux Isotope Reactor (HFIR) at ORNL, some of the SNF is storred on-site awaiting transfer to SRS in South Carolina.

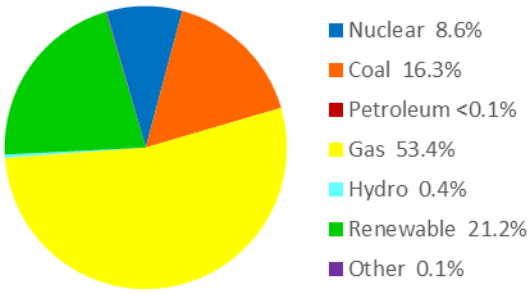
TEXAS



Elected Officials as of January 2021[1,2]

Governor:	Greg Abbott (R)
Senators:	John Cornyn (R)
	Ted Cruz (R)
Representatives:	
District 10:	Michael McCaul (R)
District 13:	Ronny Jackson (R)
District 17:	Pete Sessions (R)
District 25:	Roger Williams (R)
District 27:	Michael Cloud (R)

Texas: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

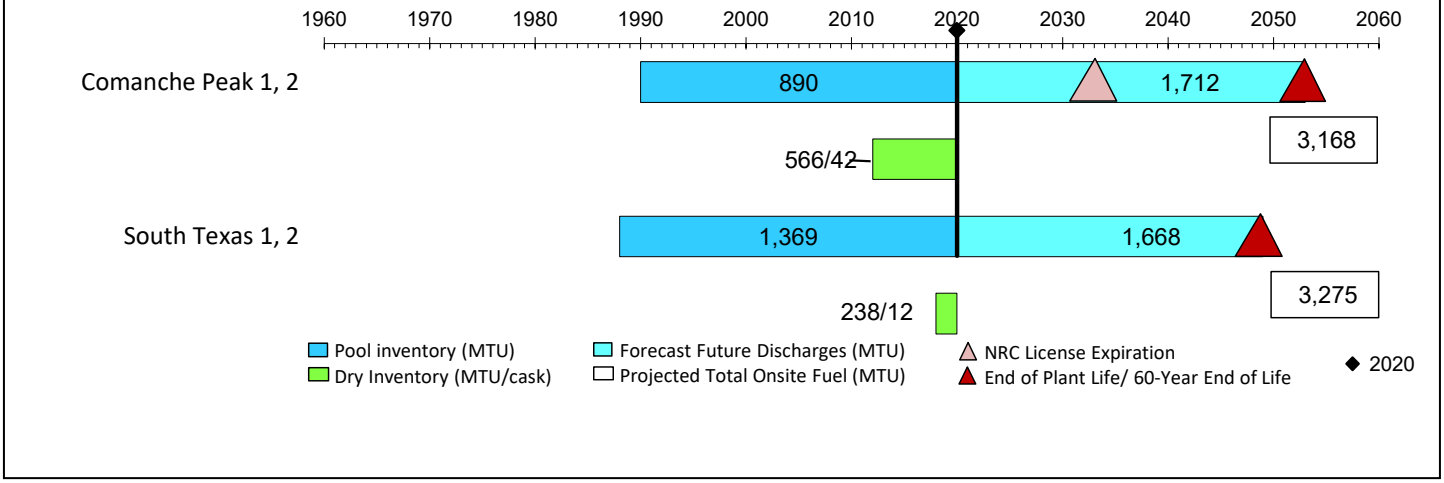


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
10	University of Texas	University of Texas	Michael McCaul (R)	1992-License R-129	R&TRF TRIGA Mark II, 1,100kW/ Operating		
13	Pantex Plant	DOE-NNSA[8]	Ronny Jackson (R)		Operating		
17	Texas A&M 1	Texas A&M	Pete Sessions (R)	1957-License R-23	R&TRF AGN-201M #106, 0.005kW/ Operating		
	Texas A&M 2			1961-License R-83	R&TRF TRIGA Mark I, 1,000kW/Operating		
25	Comanche Peak 1	TEX Operations Company, LLC	Roger Williams (R)	1990-2030	PWR/Operating	2012/GL	1,597
	Comanche Peak 2			1993-2033	PWR/Operating		1,571
27	South Texas 1	STP Nuclear Operating Co.	Michael Cloud (R)	1988-2047	PWR/Operating	2019/GL	1,614
	South Texas 2			1989-2048	PWR/Operating		1,661

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 804 MTU in 54 casks **Pool: 2,259 MTU** **Total: 3,063 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$812.3 million paid	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

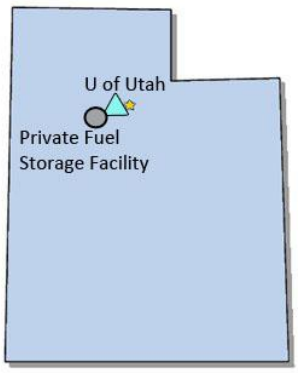
[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] DOE regulated facility.

UTAH

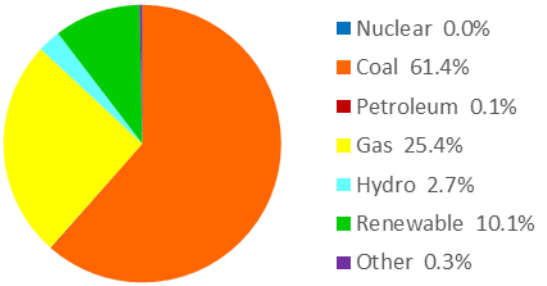


Elected Officials as of January 2021[1,2]

Governor:	Spencer Cox (R)
Senators:	Mitt Romney (R)
	Mike Lee (R)
Representative:	
District 2:	Chris Stewart (R)

△ Operating Research Reactor (1 at 1 site)
● Commercial Dry Storage Site, permitted but not constructed

Utah: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)



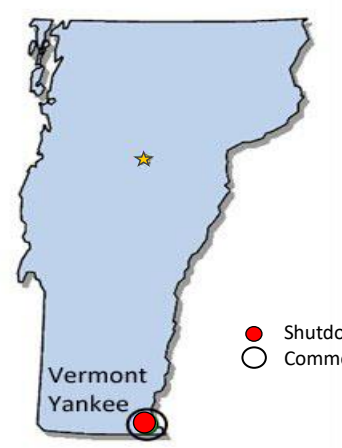
Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected
2	University of Utah	University of Utah	Chris Stewart (R)	1975- License R-126	R&TRF TRIGA Mark I, 100kW/ Operating		

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

VERMONT

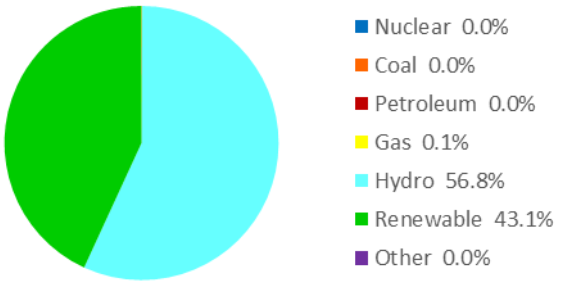


Shutdown Reactor (1 at 1 site)
Commercial Dry Storage Site (1 site)

Elected Officials as of January 2021[1,2]

Governor:	Phil Scott (R)
Senators:	Patrick Leahy (D)
	Bernie Sanders (I)
Representatives:	
District At-Large:	Peter Welch (D)

Vermont: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

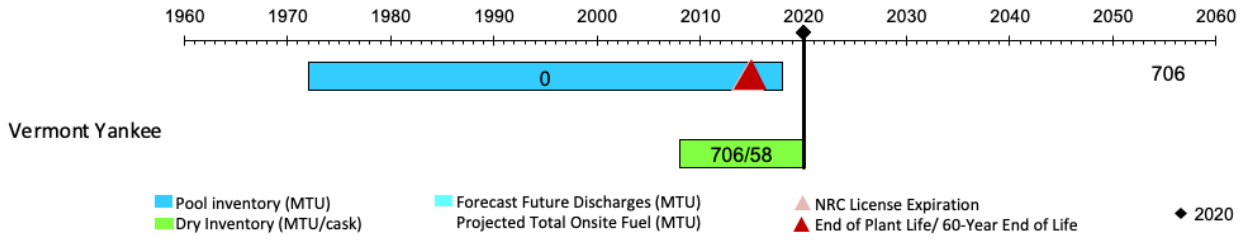


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
1	Vermont Yankee	NorthStar Vermont Yankee	Peter Welch (D)	1973-2014 DECON in Progress	BWR/ Early Shutdown	2008/GL	706

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 706 MTU in 58 casks **Pool: 0 MTU** **Total: 706 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$272.3 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors,Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

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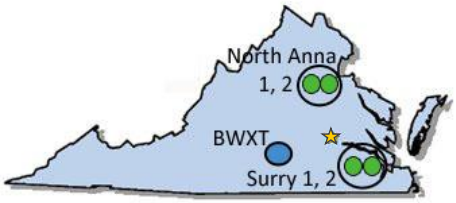
VIRGINIA

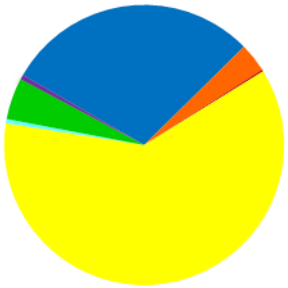


Operating Reactors (4 at 2 sites)
Commercial Dry Storage Sites (2 sites)
Commercial Research and Development Site (1 site)

Elected Officials as of January 2021[1,2]

Governor:	Ralph Northam (D)
Senators:	Mark Warner (D)
	Timothy Kaine (D)
Representatives:	
District 3:	Robert C. Scott (D)
District 6:	Ben Cline (R)
District 7:	Abigail Spanberger (D)

Virginia: 2020 Electricity Generation Mix[3]
(includes utilities and independent power producers)

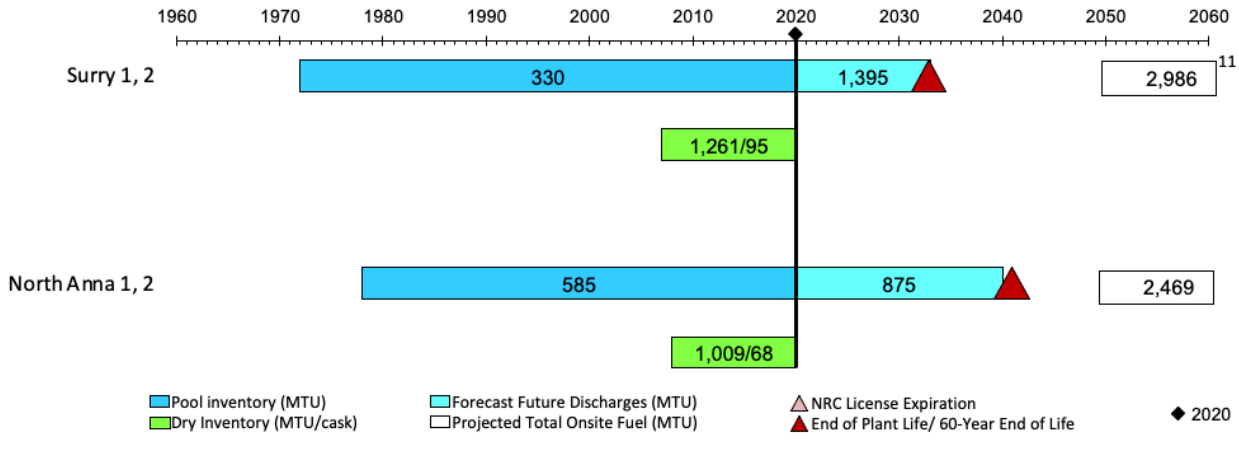


Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
3	Surry 1	Dominion Southeast Energy.	Robert C. Scott (D)	1972-2032	PWR/Operating	1986/SL 2007/GL	1,493[8]
	Surry 2			1973-2033	PWR/Operating		1,524[8]
6	BWX Technologies	BWX Technologies	Ben Cline (R)	SNM-42[9]	Dry and pool storage/ Operating[10]	See Note[9]	
7	North Anna 1	Dominion Southeast Energy	Abigail Spanberger (D)	1978-2038	PWR/Operating	1998/SL 2008/GL	1,216
	North Anna 2			1980-2040	PWR/Operating		1,253

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 2,270 MTU in 163 casks **Pool: 915 MTU** **Total: 3,185 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$837.0 million paid[12]	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] Surry 1 and Surry 2 discharges includes 31 MTU transferred to Idaho National Laboratory for examination and testing.

[9] [Federal Register Volume 72, Number 235 [Notices] Pages 69234-69236] Renewed license for Mt. Athos facility in Lynchburg, Virginia was issued on March 29, 2007.

[10] Facility manufactures nuclear fuel elements. Dry and wet storage of SNF is included in the operating license.

[11] SNF in storage does not include 31 MTU transferred to Idaho National Laboratory.

[12] Includes one-time fee paid by B&W.

WASHINGTON

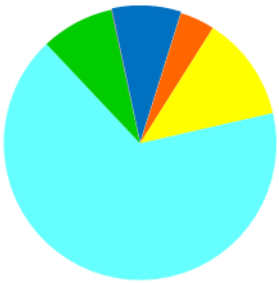
Operating Reactors (1 at 1 site)
Commercial Dry Storage Site (1 site)
Operating Research Reactor (1 at 1 site)
DOE owned SNF and Reprocessing Waste at Hanford
Surplus Plutonium at Hanford

Elected Officials as of January 2021[1,2]

Governor:	Jay Inslee (D)
Senators:	Patty Murray (D)
	Maria Cantwell (D)
Representatives:	
District 4:	Dan Newhouse (R)
District 5:	Cathy McMorris Rodgers (R)

Washington: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



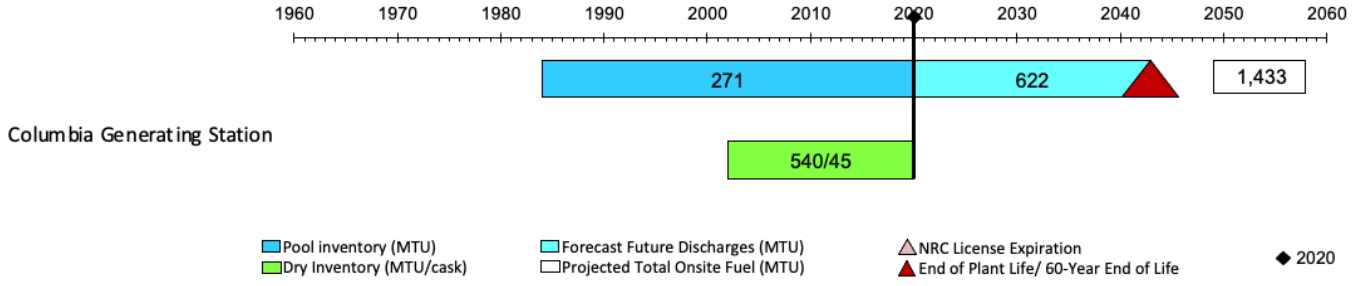
Nuclear 8.2%
Coal 4.1%
Petroleum <0.1%
Gas 12.5%
Hydro 66.5%
Renewable 8.7%
Other 0.1%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
4	Columbia Generating Station	Energy Northwest	Dan Newhouse (R)	1984-2043	BWR/ Operating	2002/GL	1,433
	Hanford Reservation	DOE[8]		None	Various/ Shutdown		
5	Washington State University	Washington State University	Cathy McMorris Rodgers (R)	1961- License R-76	R&TRF TRIGA, 1,000kW/ Operating		

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 540 MTU in 45 casks **Pool: 271 MTU** **Total: 811 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$198.9 million paid	**$0.0 million one-time fee owed**

1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

4 Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] DOE Regulated Facility

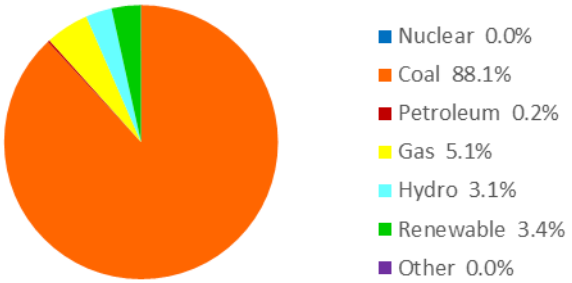
WEST VIRGINIA

Elected Officials as of January 2021[1,2]

Governor:	Jim Justice (D)
Senators:	Shelley Capito (R)
	Joe Manchin (D)

West Virginia: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

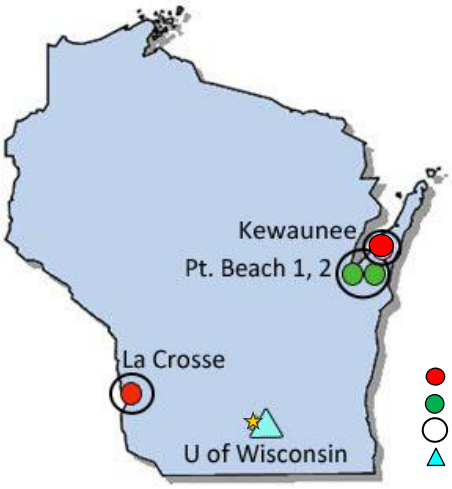


1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

WISCONSIN



Elected Officials as of January 2021[1,2]

Governor:	Tony Evers (D)
Senators:	Ron Johnson (R)
	Tammy Baldwin (D)
Representatives:	
District 2:	Marc Pocan (D)
District 3:	Ron Kind (D)
District 6:	Glenn Grothman (R)
District 8:	Mike Gallagher (R)

- Shutdown Reactor (2 at 2 sites)
- Operating Reactors (2 at 1 site)
- Commercial Dry Storage Sites (3 sites)
- Operating Research Reactor (1 at 1 site)

Wisconsin 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)

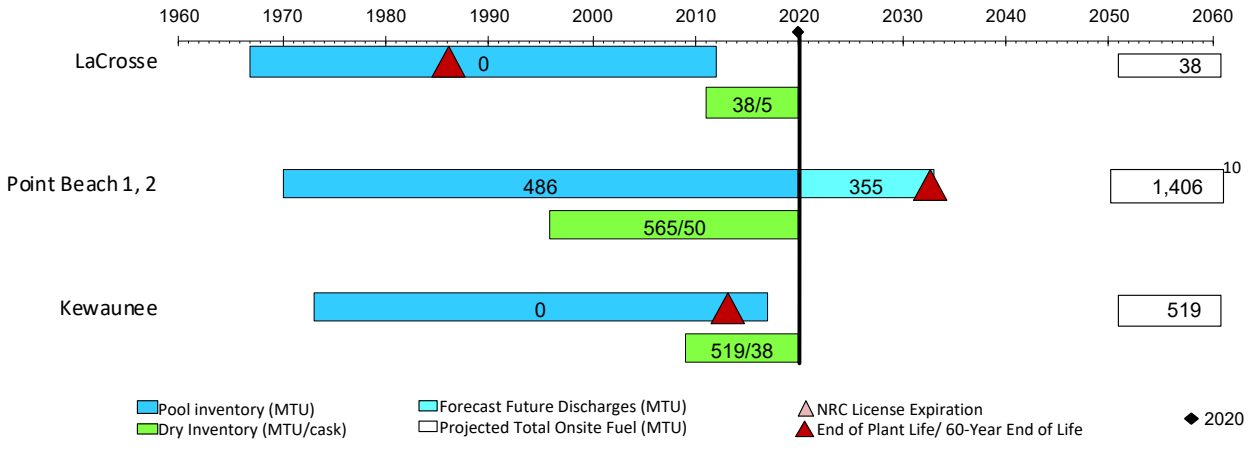
- Nuclear 15.8%
- Coal 38.7%
- Petroleum 0.2%
- Gas 34.9%
- Hydro 4.7%
- Renewable 5.7%
- Other 0.1%

Cong. Dist.	Facility	NRC Licensee	Representative	Operating License Period/Status	Facility Type/Status	ISFSI License Year/Type	SNF (MTU) Total Projected[4]
2	University. of Wisconsin	University of Wisconsin	Marc Pocan (D)	1960-License R-74	R&TRF TRIGA Mark 1, 1,000kW/ Operating		
3	LaCrosse	Dairyland Power Cooperative	Ron Kind (D)	1967-1987/ DECON in progress	BWR/Shutdown	2011/GL	38[8]
6	Point Beach 1	NextEra Energy Point Beach LLC	Glenn Grothman (R)	1970-2030	PWR/Operating	1996/GL	708[9]
	Point Beach 2			1973-2033	PWR/Operating		702
8	Kewaunee	Dominion Generation	Mike Gallagher (R)	1973-2013[9] SAFSTOR	PWR/ Early Shutdown	2009/GL	519

COMMERCIAL SPENT FUEL ONSITE INVENTORY[5]

Dry: 1,122 MTU in 93 casks **Pool: 486 MTU** **Total: 1,608 MTU**

SPENT NUCLEAR FUEL STORAGE STATUS[6]



NUCLEAR WASTE FUND[7]	
$416.4 million paid	**$0.0 million one-time fee owed**

[1] Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

[2] Governor from https://www.nga.org/governors, Accessed January 31, 2021.

[3] Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases..

[4] Forecast SNF discharges from individual reactors from the Reference Scenario from Appendix C and does not include any applicable transfers. Totals may vary slightly due to rounding.

[5] State total estimated SNF in dry and pool storage as of December 31, 2020 from Appendix D. These quantities includes applicable SNF transfers. Totals may vary slightly due to rounding.

[6] Current quantities of SNF in dry and pool storage as of December 31, 2020 and forecast SNF discharges from individual reactors from the Reference Scenario in Appendix B and C. Current storage quantities includes applicable transfers. Totals may vary slightly due to rounding.

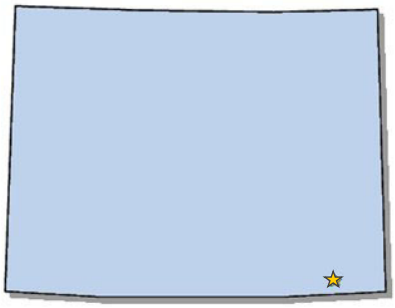
[7] The Nuclear Waste Policy Act established the Federal Government's responsibility to provide permanent disposal of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and the Nuclear Waste Fund, composed of payments made by the generators and owners of SNF (primarily nuclear utilities) and HLW, to ensure that the costs of carrying out activities relating to the disposal be borne by the generators and owners of the SNF and HLW. A “one-time fee” was established for SNF created before April 7, 1983, and an ongoing quarterly fee based on electricity generated and sold from April 7, 1983 forward. Payments and amounts owed are as of December 31, 2020 using the Department of Energy Consolidated Accounting & Investment System (CAIS) data. Paid amounts are net of fee and interest credits/refunds. One-time fee owed includes both fees and interest on fees.

[8] Discharges includes 0.12 MTU transferred to Savannah River Site.

[9] Discharges includes 2 MTU transferred to Idaho National Laboratory.

[10] SNF in storage does not include 2 MTU transferred to Idaho National Laboratory.

WYOMING

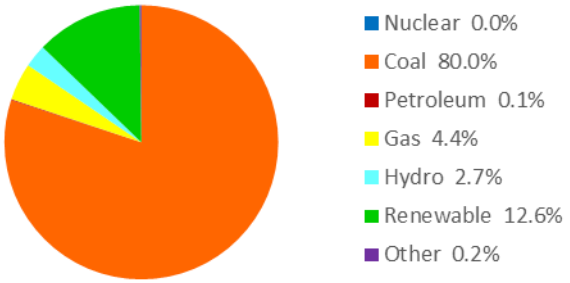


Elected Officials as of January 2021[1,2]

Governor:	Mark Gordon (R)
Senators:	Cynthia Lummis (R)
	John Barrasso (R)

Wyoming: 2020 Electricity Generation Mix[3]

(includes utilities and independent power producers)



1 Data for Elected Officials from https://www.govtrack.us/congress, Accessed January 31, 2021.

2 Governor from https://www.nga.org/governors, Accessed January 31, 2021.

3 Data for Electricity Generation Mix from Tables 1.4.B-1.13.B, Electric Power Monthly - January 2021. Year-to-Date Data through November 2020. Petroleum includes both liquid and coke. Gas includes both natural gas and other gases. Hydro includes both conventional and pumped storage. Renewable includes wind, biomass, geothermal, and solar. Other includes manufactured, supplemental gaseous fuel, propane, and waste gases.

35 States with SNF from Nuclear Power Reactors

4 States with Research Reactors Only

Approximate Amounts in Metric Tons Heavy Metal (Estimated 12/31/20)

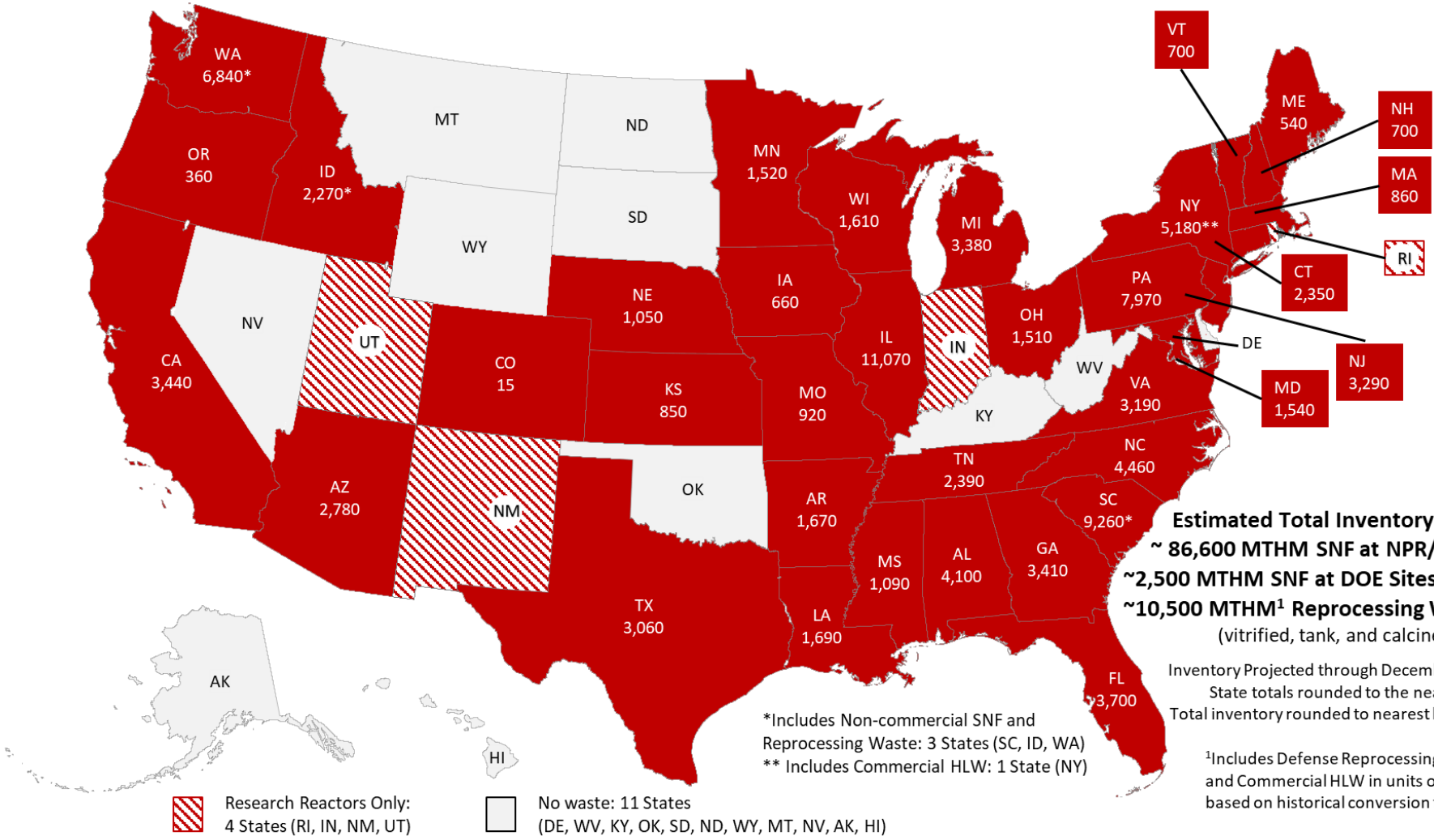
SNF at DOE-Managed Sites (CO, ID)

Research reactors only (IN, NM, RI, UT)

Note: Quantities of SNF from research and defense programs and additional commercial-origin SNF stored under DOE authority are not included.

39 States with SNF/Reprocessing Waste

Approximate amounts shown in Metric Tons Heavy Metal (MTHM)

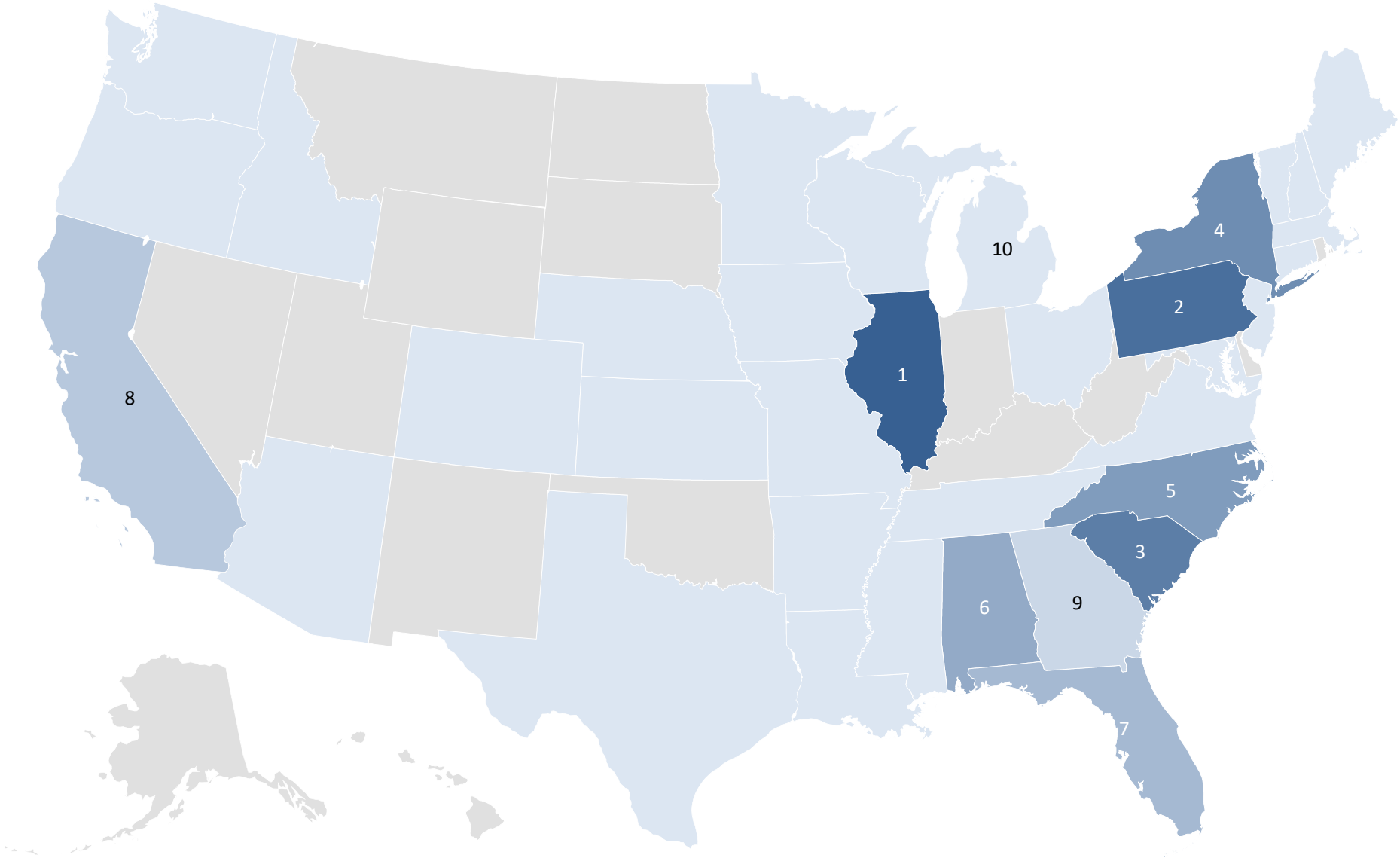


Estimated Total Inventory:
~ 86,600 MTHM SNF at NPR/ISFSI Sites
~2,500 MTHM SNF at DOE Sites
~10,500 MTHM[1] Reprocessing Waste
(vitrified, tank, and calcine)

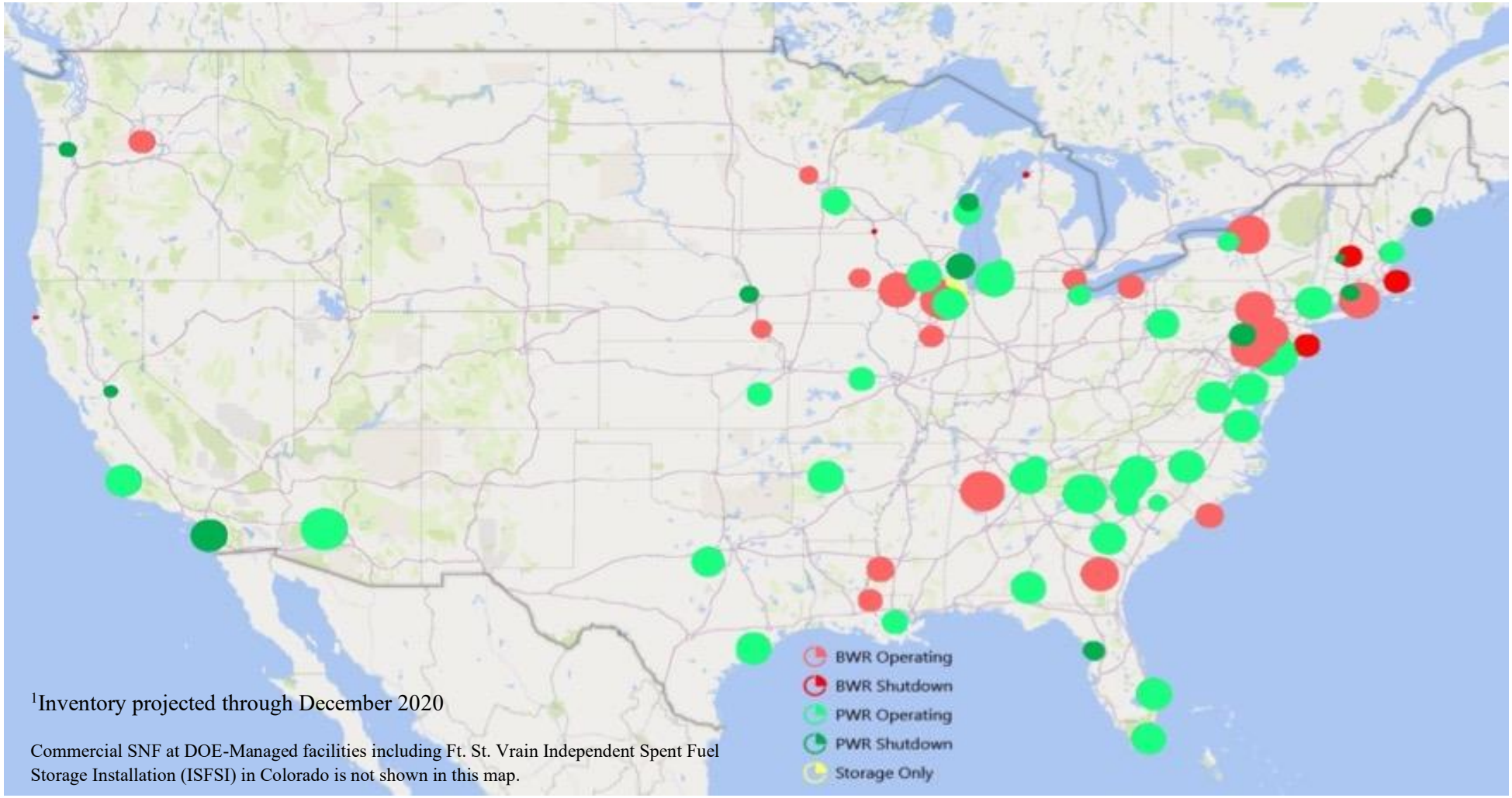
Inventory Projected through December 2020
State totals rounded to the nearest ten
Total inventory rounded to nearest hundred

[1]Includes Defense Reprocessing Waste and Commercial HLW in units of MTHM based on historical conversion factors.

Top 10 states with LWR SNF



Light Water Reactor SNF at U.S. Nuclear Power Reactor Sites[1]



[1]Inventory projected through December 2020

Commercial SNF at DOE-Managed facilities including Ft. St. Vrain Independent Spent Fuel Storage Installation (ISFSI) in Colorado is not shown in this map.