Utility-Scale CFE Generation Info Day

Phase 2

Jeff Hynds

Site Water Utility Systems, and CFE Generation Program Manager

DOE-SR

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Agenda

- **Overview of Savannah River Site (SRS) Mission**
- **Overview of Cleanup to Clean Energy Program**
- **SRS Path to 100% Carbon-Free Energy (CFE) Usage**
  - CFE Requirements from EO 14057
  - Phase 1: Solar Power Generation
  - Phase 2: Other CFE Technologies
- **Factors for Consideration**
- **Key Requirements at SRS**
  - Site Use Permit Process
  - Environmental Baseline Survey
  - National Environmental Policy Act (NEPA)
  - National Historic Preservation Act (NHPA) Section 106

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SRS Overview

Savannah River Site™

U.S. Department of Energy site located in Aiken, South Carolina

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SRS Overview 1

Dedicated to maintaining the highest possible safety and security standards, the Savannah River Site (SRS) is a key U.S. Department of Energy (DOE) industrial complex responsible for environmental stewardship, environmental cleanup, nuclear waste management and disposition of nuclear materials.

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SRS Overview 2

SRS is committed to its people, missions and the future. SRS has a long track record of being one of the safest sites in the DOE complex and one of the safest major industrial sites in the world. Protecting workers, the public, the environment and national security interests are our highest goals.

SRS processes and stores nuclear materials in support of national defense and U.S. nuclear nonproliferation efforts. The Site also develops and deploys technologies to improve the environment and treat solid and liquid nuclear and hazardous wastes left from the Cold War. While current missions remain the highest priority, SRS leadership places great importance on developing broader missions for SRS that use its unique capabilities in order to address critical national missions.

SRS™

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SRS Overview 3

During the 1950s, SRS began to produce materials used in nuclear weapons, primarily tritium and plutonium-239. Five reactors and support facilities were built to produce these nuclear materials. Irradiated materials were moved from the reactors to one of the two chemical separations plants. In these facilities, known as "canyons," the irradiated fuel and target assemblies were chemically processed to separate useful products from waste. After refinement, nuclear materials were shipped to other DOE sites for final application. SRS produced about 36 metric tons of plutonium from 1953 to 1988.

Originally farms and swamp land, SRS now encompasses a timber and forestry research center managed by the U.S. Forest Service-Savannah River. In 1972, SRS was designated as the first National Environmental Research Park. Today, the vast forests of SRS are home to rare and endangered species including wood storks, bald eagles and red-cockaded woodpeckers, as well as wild turkeys, white-tailed deer and otters.

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SRS Overview 4

SRS is owned by the U.S. Department of Energy.

Federal agencies at SRS include:

Department of Energy: Savannah River Operations Office

National Nuclear Security Administration

U.S. Forest Service-Savannah River

U.S. Nuclear Regulatory Commission

U.S. Army Corps of Engineers

1950

President Harry S. Truman authorizes construction of SRS

Six towns were moved to make way for the Savannah River Plant (now SRS).

$3.8

billion

annual SRS budget

12,700

current SRS employees

(contractors and federal agencies)

5

reactors originally constructed

Also, two chemical separations plants, a heavy water extraction plant, a nuclear fuel and target fabrication facility, a tritium extraction facility and waste management facilities.

310

square-mile site

Located on the Savannah River, which borders South Carolina and Georgia. SRS covers 198,046 acres, including parts of Aiken, Barnwell and Allendale counties in South Carolina.

6

major DOE prime contractors

Savannah River Nuclear Solutions, LLC
Management and operations of SRS

Battelle Savannah River Alliance, LLC
Management and operations of Savannah River National Laboratory

Savannah River Mission Completion, LLC
Liquid waste operations

Ameresco
Biomass Cogeneration Facility

Centerra Group, LLC
SRS security

University of Georgia
Savannah River Ecology Laboratory

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SRS Overview 5

The 'City' of SRS

fire department and emergency services

230 miles of roads and first South Carolina cloverleaf

medical facilities

information technology networks

weather center

biofuels plant for power generation

locomotive and train tracks

water and electrical utilities

To support operations, SRS maintains an infrastructure similar to a small city.

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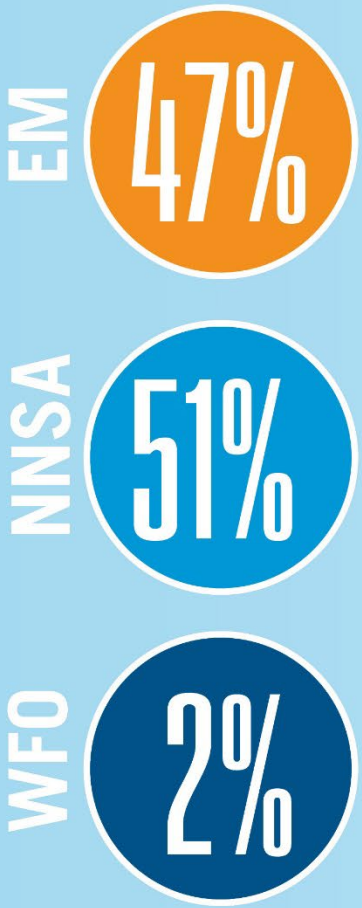
SRS Overview 6

SRS Missions



Management, stabilization and disposition of nuclear materials

Management and disposition of solid, liquid and transuranic wastes

Spent fuel management

Environmental remediation and cleanup

Tritium operations and extraction

Nonproliferation support

Foreign fuel receipts

Pit production mission

Surplus Pu disposition

Other federal agencies

Other DOE sites

Private industry

Other minor entities

Who's at SRS

Savannah River Nuclear Solutions
Management and Operations

Battelle Savannah River Alliance
Management and Operations of the Savannah River National Laboratory

Savannah River Mission Completion, LLC
Liquid Waste Operations

Centerra
SRS security

University of Georgia
Savannah River Ecology Laboratory

U.S. Forest Service–Savannah River
Federal entity

21CC00008

What the Executive Order #14057 Requires

Section 102(i): *100 percent carbon pollution-free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon pollution-free electricity, as defined in section 603(a) of this order;*

Section 203: *Each agency shall increase its percentage use of carbon pollution-free electricity, so that it constitutes 100 percent of facility electrical energy use on an annual basis and seek to match use on an hourly basis to achieve 50 percent 24/7 carbon pollution-free electricity, by fiscal year 2030.*

In addition, agencies shall facilitate new carbon pollution-free electricity generation and energy storage capacity by authorizing use of their real property assets, such as rooftops, parking structures, and adjoining land, for the development of new carbon pollution-free electricity generation and energy storage through leases, grants, permits, or other mechanisms, to the extent permitted by law.

Section 603(d): *"Carbon pollution-free electricity" means electrical energy produced from resources that generate no carbon emissions, including marine energy, solar, wind, hydrokinetic (including tidal, wave, current, and thermal), geothermal, hydroelectric, nuclear, renewably sourced hydrogen, and electrical energy generation from fossil resources to the extent there is active capture and storage of carbon dioxide emissions that meets EPA requirements;*

Section 603(a): *“24/7 carbon pollution-free electricity" means carbon pollution-free electricity procured to match actual electricity consumption on an hourly basis and produced within the same regional grid where the energy is consumed*

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SRS Meeting the CFE Requirement in EO #14057

- ***Purchased CFE*** is electricity purchased from a qualifying CFE generation source with the associated EACs, i.e., the original associated energy attributes have not been separately sold, transferred, or retired.
- ***On-site CFE*** is electricity generated at a Federal facility. To count CFE produced at a Federal facility toward the net annual CFE requirement, an agency must obtain and retire the EACs sourced from the on-site CFE generation.
- ***Purchased EACs*** are EACs that are procured independently from the agency's purchases of physical power, often referred to as "unbundled" EACs.
- ***Grid-supplied* CFE** is CFE delivered as part of default electricity service or the electricity grid mix from a utility or electric service provider (in contrast to purchased CFE, in which the CFE and associated EAC are specified contractually)

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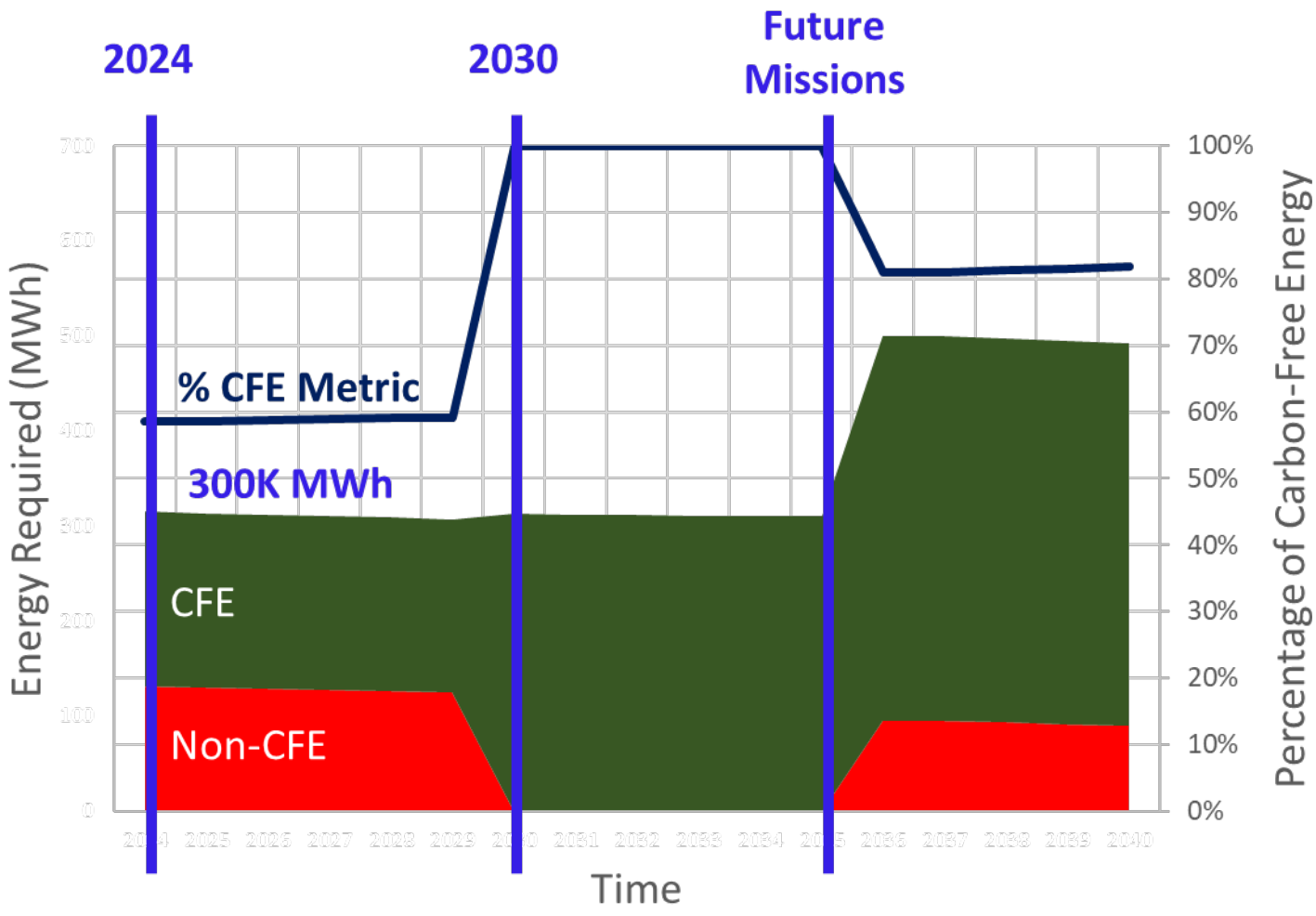
SRS CFE Percentage Going Forward



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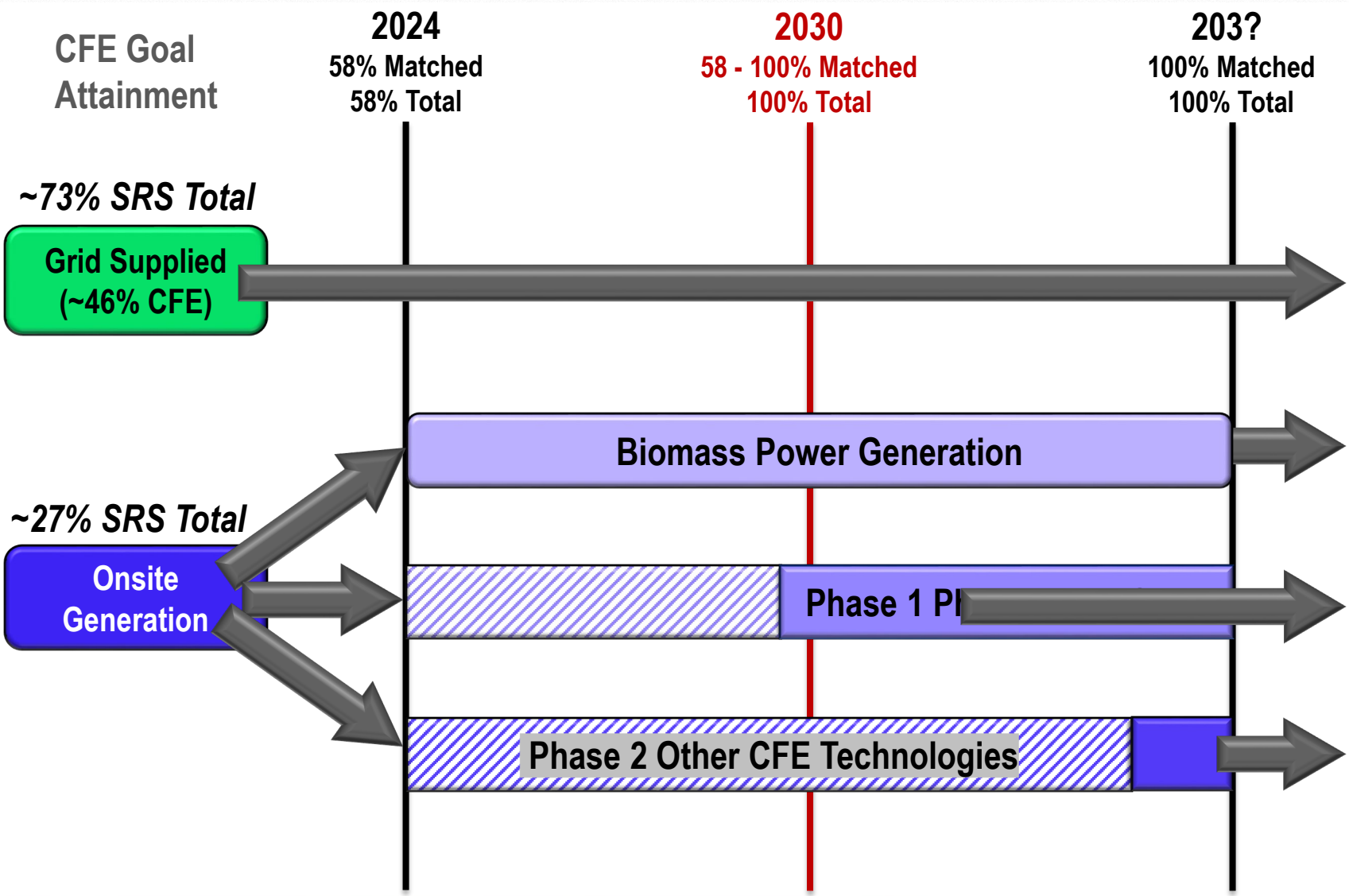
SRS Parallel Paths to Achieve 100% CFE Usage



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Factors for Consideration

- **Project / Technology Description** - a narrative, with supporting figures and schematics, as needed, describing and illustrating the proposed plan for the development, interconnection, construction, operation, power off-take and decommissioning of the CFE project.
- **Return to the Government** - facilitate new carbon pollution-free electricity generation and energy storage capacity by authorizing use of their real property assets.
- **Capability and Experience** –most recent and relevant projects that have been completed using the proposed technology

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- **Selection Process** - the Government will select proposal(s) that provide the combined highest performance expectations and likelihood of success

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Key Processes Required

- Site Use Permit Process
- Environmental Baseline Survey
- National Environmental Policy Act (NEPA)
- National Historic Preservation Act (NHPA) Section 106

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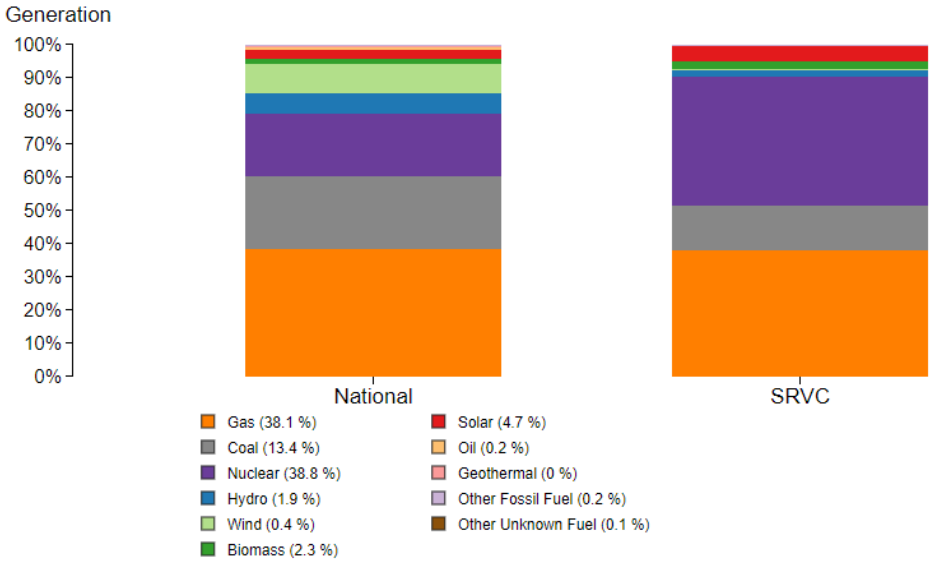
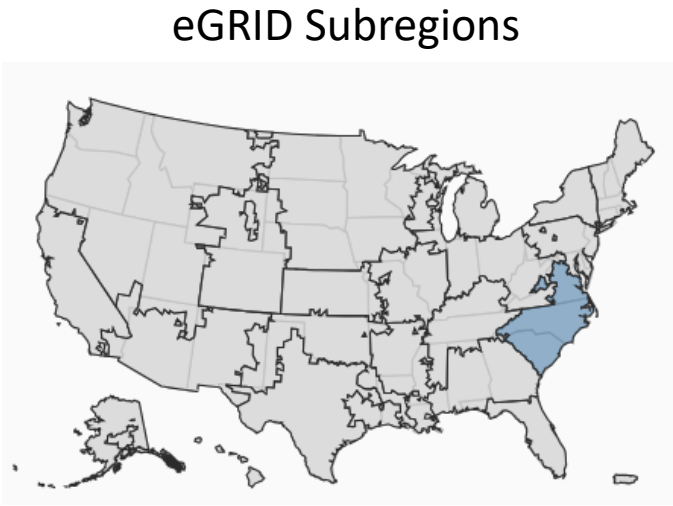
Backup Slide

SRS Plan to Achieve 2030 Mandate – Grid Supplied Power

- **Grid-supplied CFE is CFE delivered as part of default electricity service, or the electricity grid mix from a utility or electric service provider.**
  - This component of the solution addresses the 24/7 CPFE matching requirement
  - 45.8% of power consumed from the grid serving SRS is CFE
  - With biomass generation, grid power accounts for only about 75% of total SRS consumption





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