



energy

Clean • Safe • Secure • Affordable

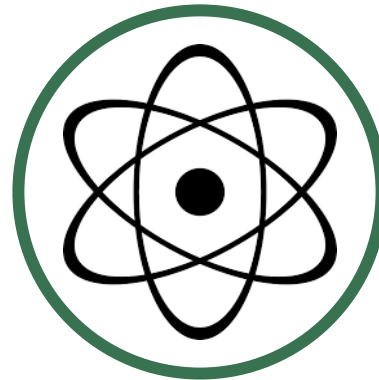


The Makings of a New Energy Era

**Environmental
Consciousness**



**Breakthrough
Technology**



**Political
Alignment**



Unprecedented Convergence

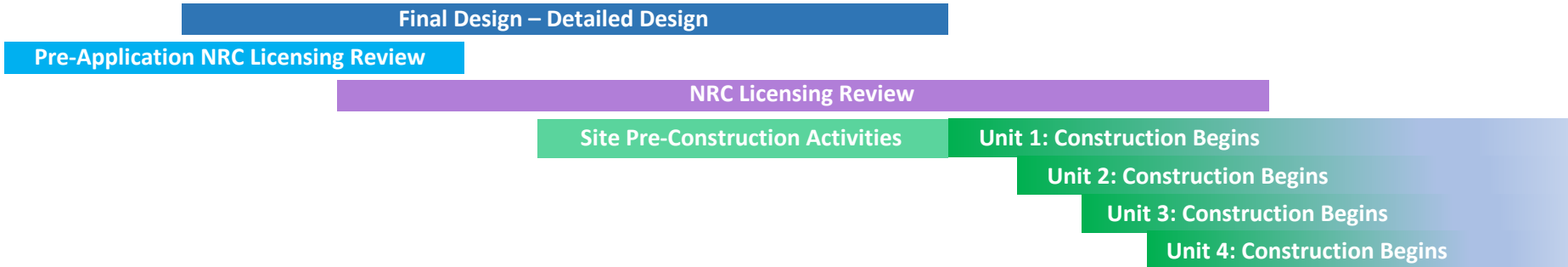
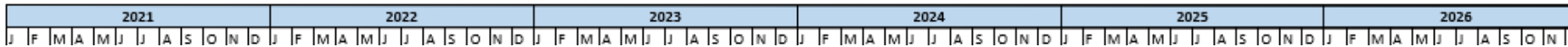
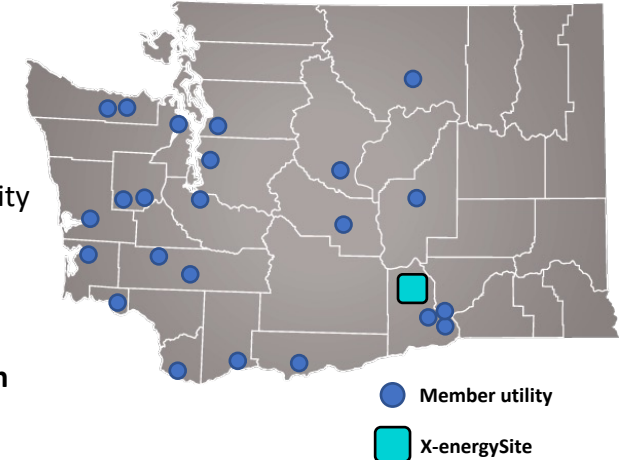
Advanced Reactor Demonstration Project

- In May 2020, the Department of Energy announced the Advanced Reactor Demonstration Program (ARDP)
- X-energy and TerraPower were selected as program winners in October 2020
- Program designed as a public-private partnership:
 - Government provides winning bids with 50% cost share for first-of-a-kind advanced nuclear plant
 - Plant must be commercial (*not* demonstration)
 - ✓ Government motive? Kick-start advanced nuclear industry
- X-energy partnered with Energy Northwest, a top-tier customer
- **ARDP supports a 320MW plant (4 modules), plus a TRISO fuel manufacturing facility**

Energy Northwest



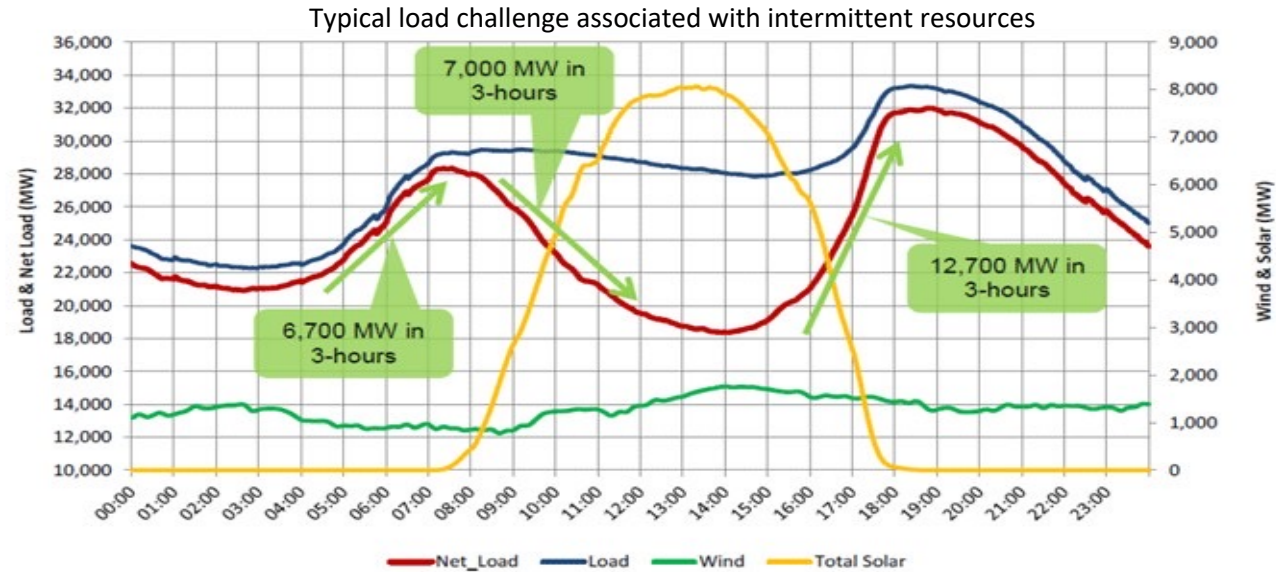
- Membership includes 28 public power utilities, including 23 of Washington state's 29 public utility districts.
- **State law mandates zero carbon grid by 2045, with limited additional upside in Washington state for renewables.**
- EN is a public agency with tax-advantaged capital access.



Advantages	Challenges	Comments
<p>Coal plants like nuclear plants have been cornerstones of communities providing well-paying jobs and large tax revenues</p>	<p>Coal plants are generally sited closer to communities and may have other industrial neighbors</p>	<p>This is a change from traditional LWR's that are generally sited far away from community center HOWEVER Converting coal sites to nuclear helps stabilize communities that would have otherwise lost a significant economic backbone</p>
<p>Adv. Reactors with an EPZ at the site boundary allows developers to take advantage of these sites</p>	<p>Creates challenges around acceptance and the social license to build</p>	<p>We are assessing the regional socio-economic impact on a 4-pack standard deployment with Frostburg State University – Maryland Energy Administration Grant</p>
<p>Leverage site characterization data Coal sites with meteorological data and some geo-technical data can help speed up site characterization needed for NRC license</p>	<p>Greenfield sites or sites with no environmental data can add at least a year to the NRC licensing process</p>	<p>Each site has different parameters and characteristics that need to be evaluated individually, based on size, environmental factors, and environmental information needed for licensing</p>
<p>Feasibility studies need to assess the current infrastructure and if it can be reused with the nuclear design: Admin buildings Water intake Switchyard</p>	<p>Re-use of the infrastructure will be dependent on the age of the equipment and also how closely the output size matches Ex: Switchyard – If the current plant is only 200 MW and you put in a 320 MW plant the switchyard is now undersized for the power output and the project does not have sufficient grid interconnection capacity rights</p>	<p>Every site has its specific facilities and infrastructure that must be evaluated based on both the particular site, size of plant and specific reactor and its characteristics</p>

(1) Right-sized power output

The reactor size of 200MWt (80MWe) has been designed to address the largest possible market providing a good fit for replacement of existing carbon-based heat sources such as coal and gas.



(2) Flexible power delivery

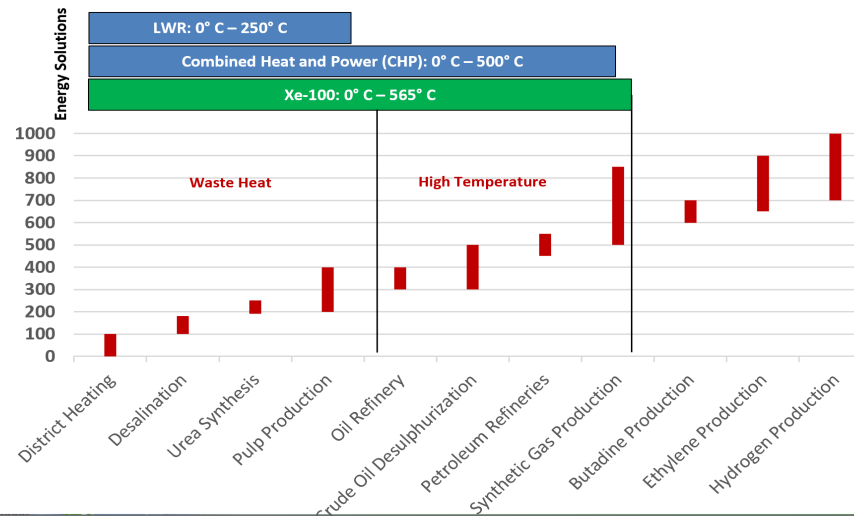
- Designed to be capable of fast and efficient load following. Load-follow with a reactor power ramp rate, up or down, of 5% per minute between 40% and 100% power.
- Ideal for utilities with renewables on their grid.

(3) Broad range of applications

Designed to be independent of the end use makes our solution deployable for electricity and many other process heat applications, such as:

- Hydrogen production;
- Petrochemical processing;
- Desalination; and
- District heating.

The Xe-100 can do both simultaneously or switch between applications.



Energy Density for Nuclear Makes It a Desirable Choice



**1 pebble:
7g with 15.5% wt
Low Enriched Uranium**

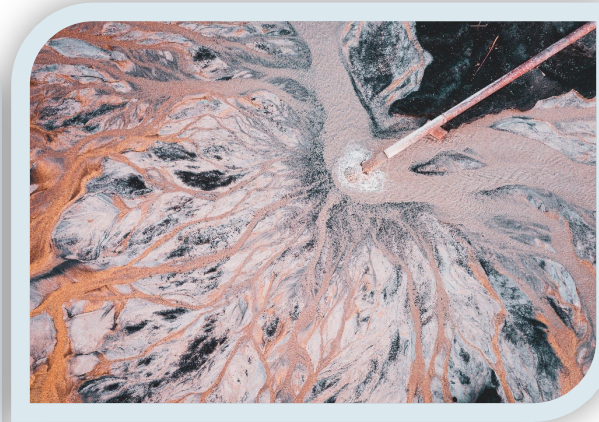
27.4 MWh



**2.66 metric tons of
coal**



**8.0 metric tons of
CO₂**



**~ 0.8 metric tons of
ash**

Power of the Pebble

