

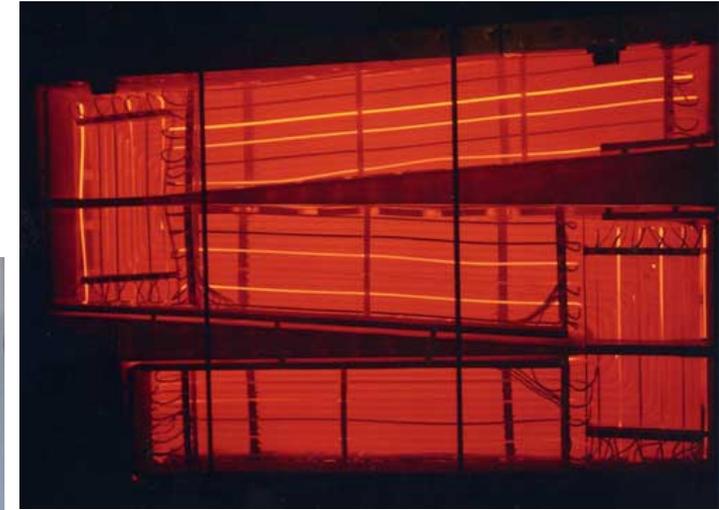
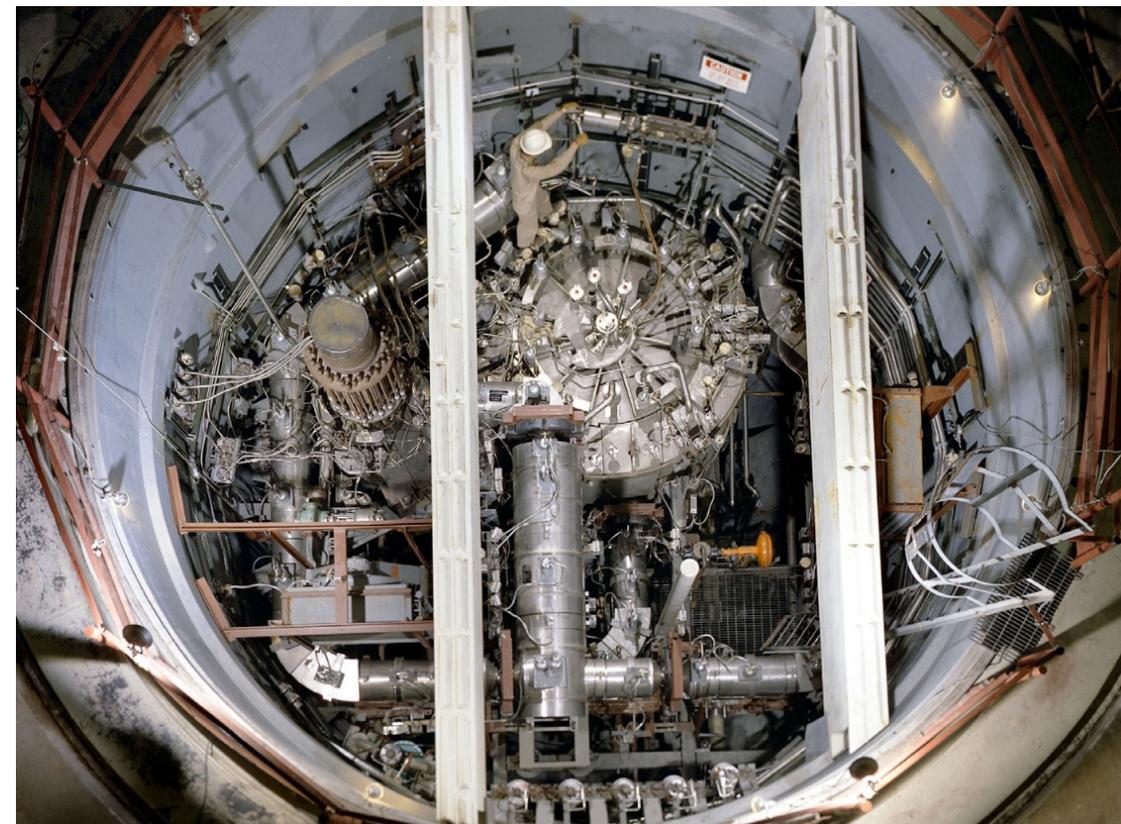
The TerraPower logo features the company name in a dark blue, sans-serif font. A green arc curves over the top right of the text. The background of the slide includes decorative elements: a large green atomic model on the left, a blue atomic model at the bottom, and a pattern of green and blue dots and arcs on the right.

TerraPower™

TerraPower and the Molten Chloride Fast Reactor

Jeff Latkowski

TerraPower is excited to celebrate and build upon the 50 years of ORNL experience & technology



By
2040....

THE WORLD'S
POPULATION
WILL INCREASE TO

9

BILLION
PEOPLE

ELECTRICITY
DEMAND
WILL GROW

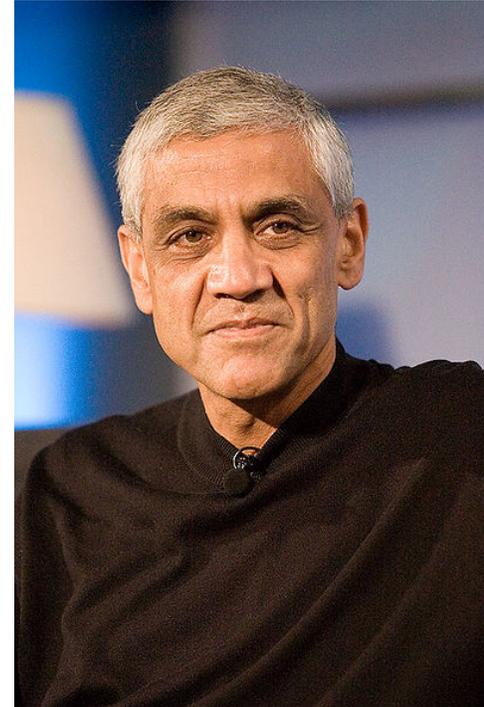
93%

Importance of Energy



Bill Gates:

*"It's crazy how little we're funding energy."
"I would encourage people who work in this area
that the importance of this is right at the top."*

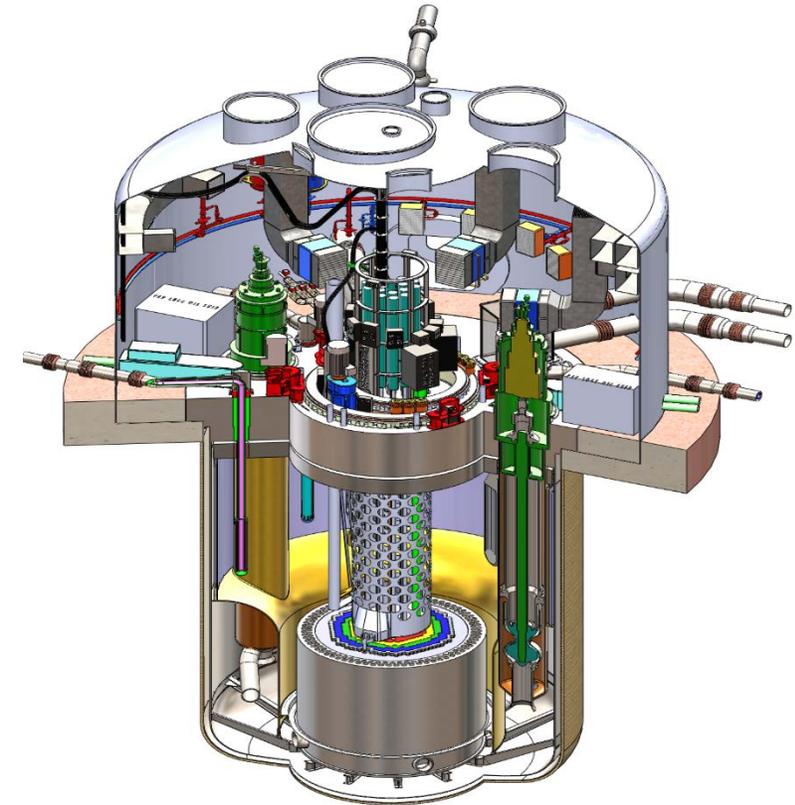


Vinod Khosla:

*"If it doesn't scale, it doesn't matter. Most of what we
talk about today—hybrid, biodiesel, ethanol, solar
photovoltaics, geothermal—I believe are irrelevant to
the scale of the problem."*

TerraPower's Vision

- TerraPower was formed in 2008 to address growing **global** energy needs
 - With climate change, pollution, and rising energy demands, a scalable solution is needed
 - All energy forms were considered
 - Fossil (coal, gas, diesel, etc.), wind, solar, etc.
- Focus on next generation nuclear energy systems that excel in economics, safety, resource utilization, waste, and proliferation resistance



Traveling Wave Reactor

TerraPower's Vision



Enhance
engineered
safety



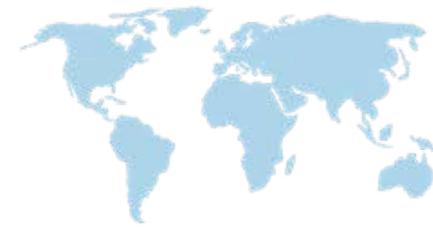
Minimize
energy costs



Offer **new**
options for
nuclear waste



Maximize
proliferation
resistance



Provide
reliable supply
of energy to all
nations

The Molten Chloride Fast Reactor meets TerraPower's vision for advanced nuclear power



Enhance engineered **safety**

- Non-reactive coolant
- Strong negative temperature & void coefficients
- Near zero excess reactivity



Minimize **energy costs**

- No fuel fabrication
- Online refueling
- High power density & efficiency



Offer **new options** for nuclear waste

- No enrichment after start-up
- Consume DU, NatU, Th and/or UNF
- Start with partial UNF load



Provide **reliable supply** of energy to all nations

- No ongoing enrichment
- Exportable / Strong non-proliferation traits
- Reduced water use
- High temperatures for non-electric markets



Maximize **proliferation resistance**

- Actinides stay in core, daughter core, or polishing system
- Actinides always mixed with lanthanides

TerraPower's capabilities position it for success

- Integrated modeling and design capabilities: neutronics, thermal hydraulics, kinetics, materials, mechanical, CFD
- Expertise in licensing, project management, procurement, quality assurance, irradiation studies, large-scale computing
- New 10,000 sf laboratory space:
 - 5-ton bridge crane, 12-ft deep experimental pit, 60-ton cooling loop
 - 37 testing stations equipped with comprehensive utilities (argon, air, water, vacuum, power)
 - 2 triple-wide & 1 double-wide glove box, 2 hoods
- Lab co-located with 11,000 sf machine shop:
 - Access to more than 20 FTEs of technicians and instrument makers
 - 3D printing, broad CNC capabilities, optical & laser scanning, welding, etc.
 - 0 loss time injuries since 2010

New facilities enable scaled-up salt synthesis, flow loops, separate and integral effects testing

