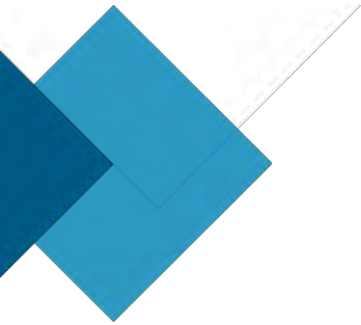


IENE/ROEC- Nuclear for SE Europe Advancing CANDU® Technology Option



Bucharest, Romania
May 6, 2015

- Copyright -



EC6®
AFCR™
CANMOX™

EC6®

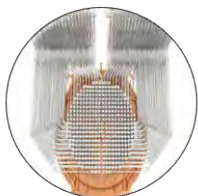
SNC-Lavalin: Advancing CANDU®

Candu Energy Inc., a wholly owned subsidiary of SNC-Lavalin, was established in 2011 to acquire the commercial reactor business of Atomic Energy of Canada Ltd.

SNC-Lavalin has exclusive rights to CANDU technology

SNC-Lavalin is the largest EPC company in Canada with projects in 100 countries and offices in more than 40 countries

Life Extension



Embalse, Argentina

Darlington NPP,
Canada

Bruce NPP, Canada

New Build



Cernavoda 3&4, Romania

Atucha 3, Argentina

AFCR, China

EC6 CANMOX, UK

O&M Services



O&M services with CANDU
utilities worldwide

Safety and operational
products and services to
global nuclear industry

NUCLEAR POWER



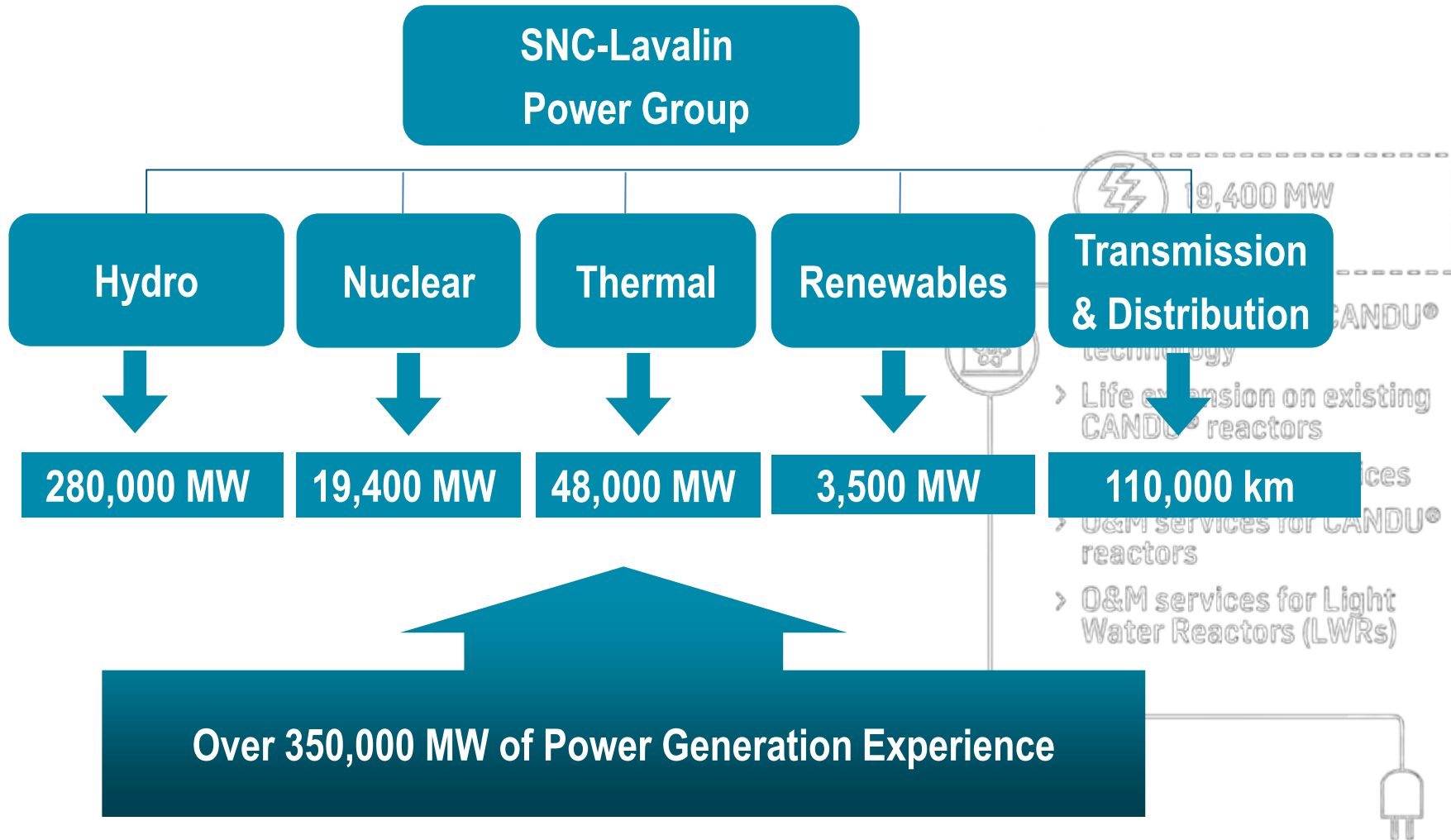
19,400 MW
TO DATE



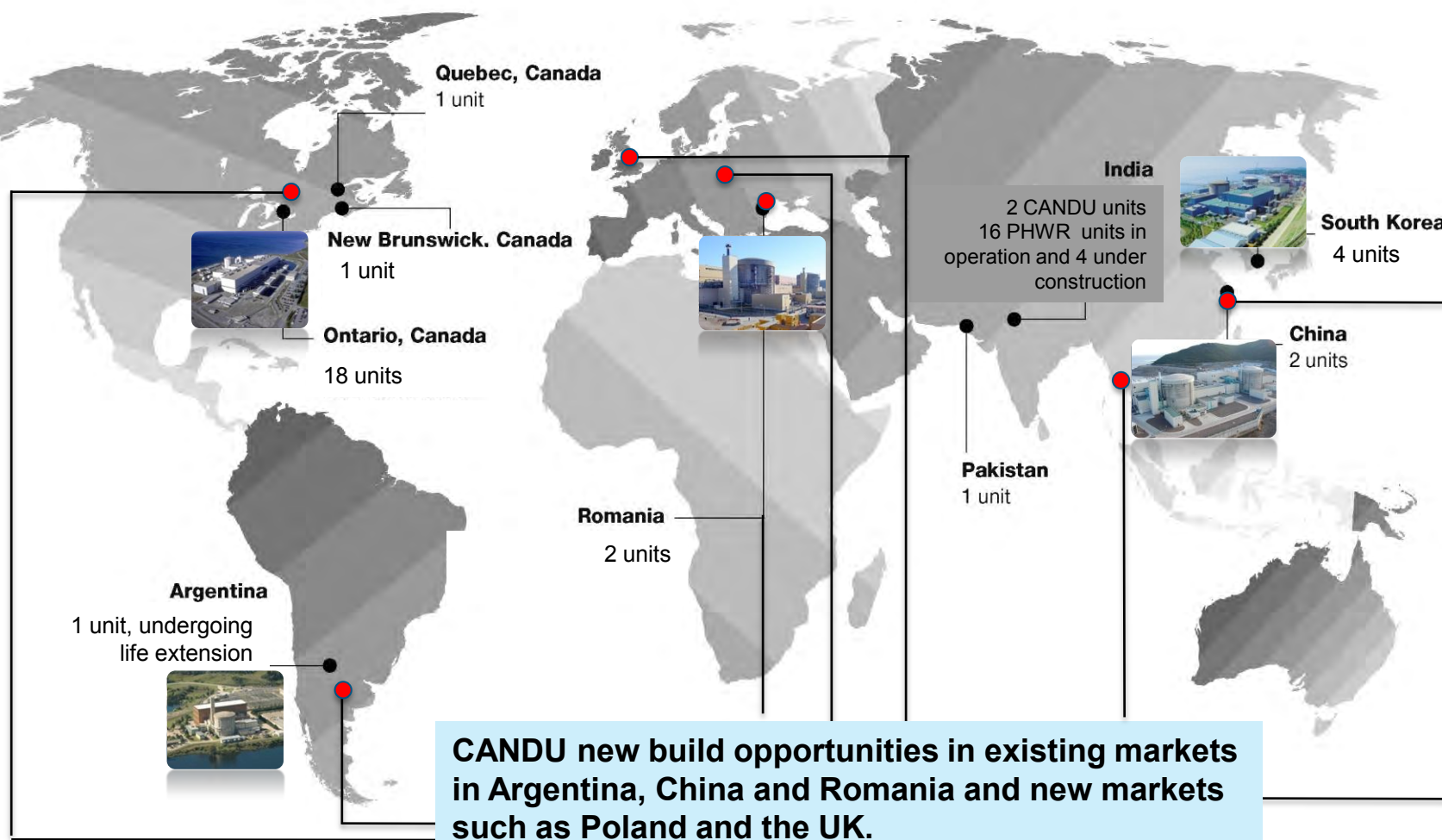
- > New builds using CANDU® technology
- > Life extension on existing CANDU® reactors
- > Refurbishment services
- > O&M services for CANDU® reactors
- > O&M services for Light Water Reactors (LWRs)



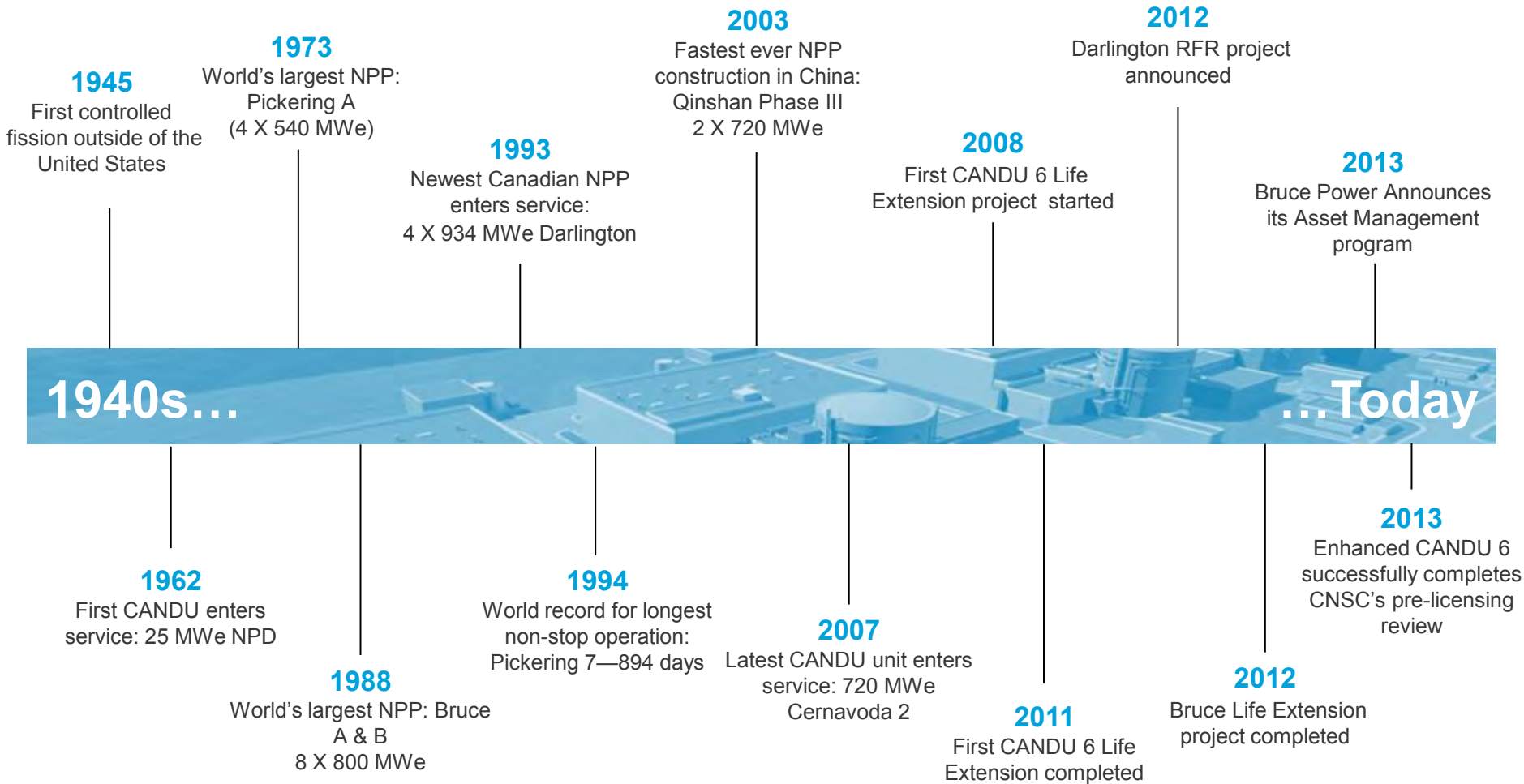
SNC-Lavalin: Power Group



CANDU® Markets - Existing and Emerging



CANDU® Milestones



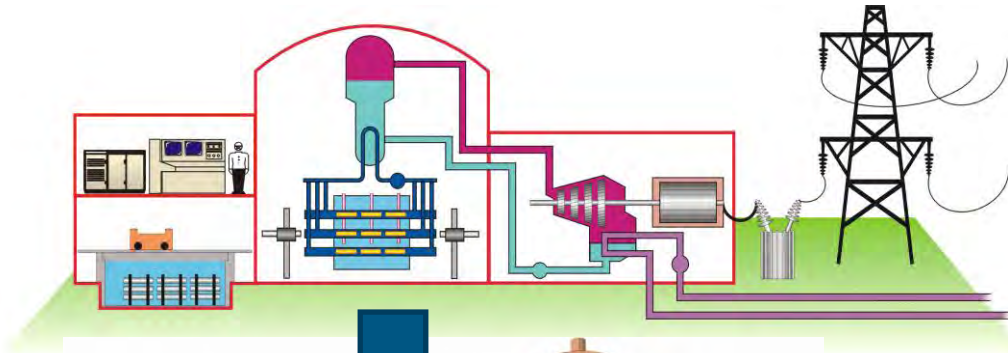
Supported by World Class R&D

- SNC-Lavalin is supported by the Canadian Nuclear Laboratories (CNL) in many aspects of Nuclear Research and Development
- CNL has specialized test facilities supporting CANDU platform including NRU & ZED-2 reactors



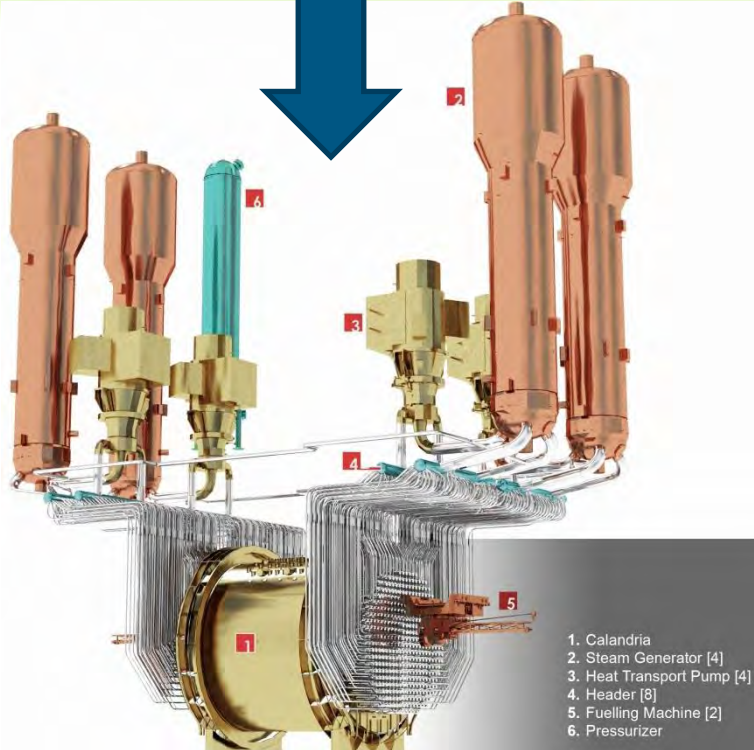
- Canadian Neutron Beam Centre
- Hot cells & irradiation analysis
- Molten fuel interaction testing
- Robotics engineering
- Experimental fuels fabrication
- Flow testing and visualization
- High-temperature loops & autoclaves
- Metallurgy, heavy water, etc.

CANDU® Power Reactor



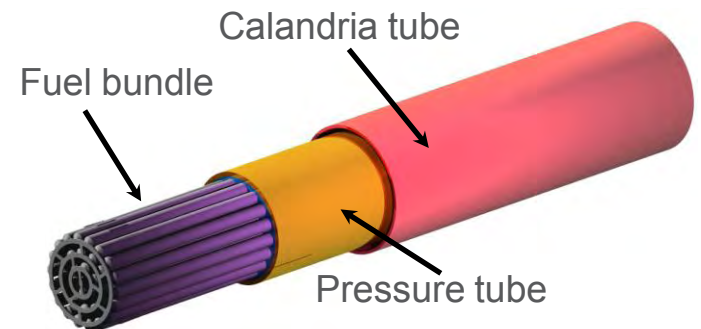
Features:

- Heavy water coolant and moderator
- On-power refueling
- Mid size - modular design (740 MWe)
- Natural Uranium as fuel
- Superior performance - average lifetime Capacity Factor (CF): 88% worldwide
- Fuel cycle flexibility



1. Calandria
2. Steam Generator [4]
3. Heat Transport Pump [4]
4. Header [8]
5. Fuelling Machine [2]
6. Pressurizer

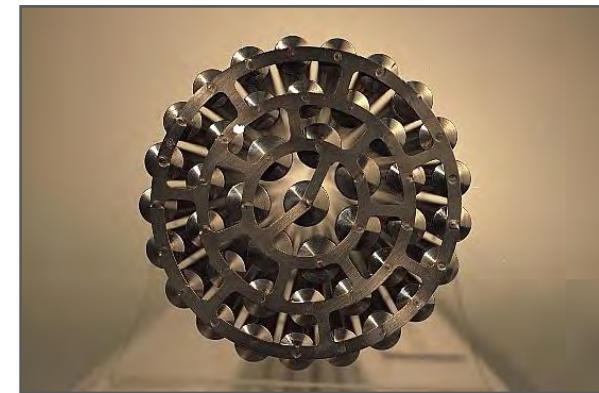
CANDU Fuel Channel Assembly



CANDU® Fuel: Simple and Efficient

The localization of CANDU fuel fabrication provides a significant advantage over Light Water Reactors by:

- Reducing dependence on imported enriched fuel
 - Developing local capability in technology manufacturing
 - Reducing overall cost of nuclear energy inputs and costs
- The use on Natural Uranium fuel in CANDU Fuel is 20% more efficient in uranium utilization than LWR fuel
 - The unique and simple design of the CANDU fuel bundles allows for localization of manufacturing capability and is unmatched by industry competitors
 - Localization of fuel has been demonstrated in all CANDU countries (China, India, Korea, Romania & Argentina) and provides significant benefit to the local economy



CANDU® Performance

New Build Delivery Record

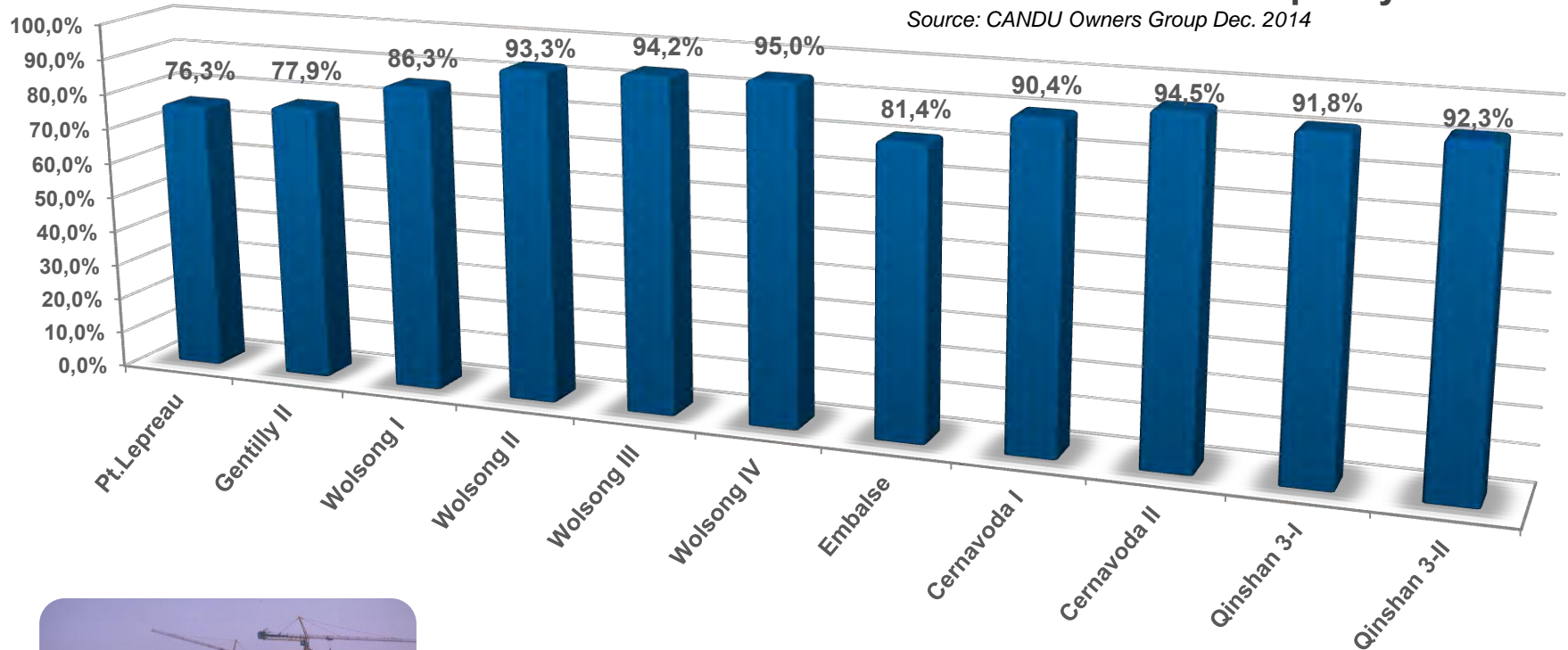
In-Service	Plant	Status
1996	Cernavoda Unit 1, Romania	On budget, on schedule
1997	Wolsong Unit 2, South Korea	On budget, on schedule
1998	Wolsong Unit 3, South Korea	On budget, on schedule
1999	Wolsong Unit 4, South Korea	On budget, on schedule
2002	Qinshan Phase III Unit 1, China	Under budget, 6 weeks ahead of schedule
2003	Qinshan Phase III Unit 2, China	Under budget, 4 months ahead of schedule
2007	Cernavoda Unit 2, Romania	On budget, on schedule



CANDU® Performance

CANDU 6 Lifetime Capacity Factor

Source: CANDU Owners Group Dec. 2014



- The global CANDU 6 fleet has a performance of over 88% lifetime and are consistently among the best performing units in the world
- Qinshan unit 2 was the top performing nuclear reactor in 2010



SNC • LAVALIN

Candu®
An SNC-Lavalin Technology

- Copyright-

© [2015] SNC-Lavalin Inc. and its member companies. All rights reserved. Unauthorized use or reproduction is prohibited.

Enhanced CANDU 6 (EC6®) – Generation III

Features

740 MW(e) Classic CANDU reactor

Natural Uranium (NU) Fuel

Heavy water coolant and moderator

Fuel channel core

On-power refuelling

Advantages

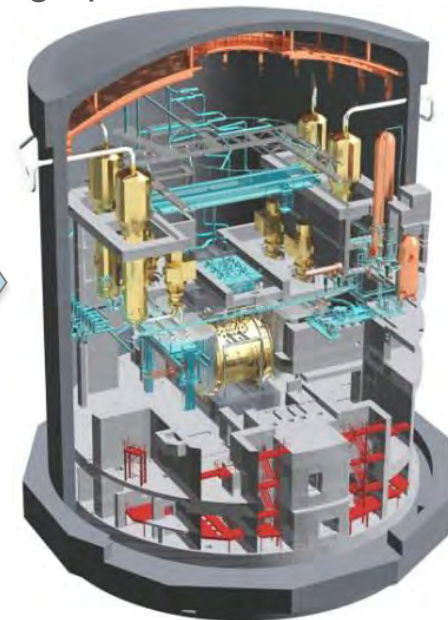
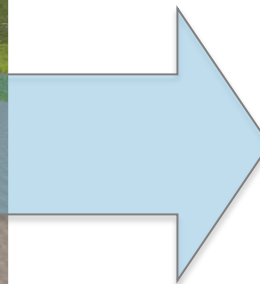
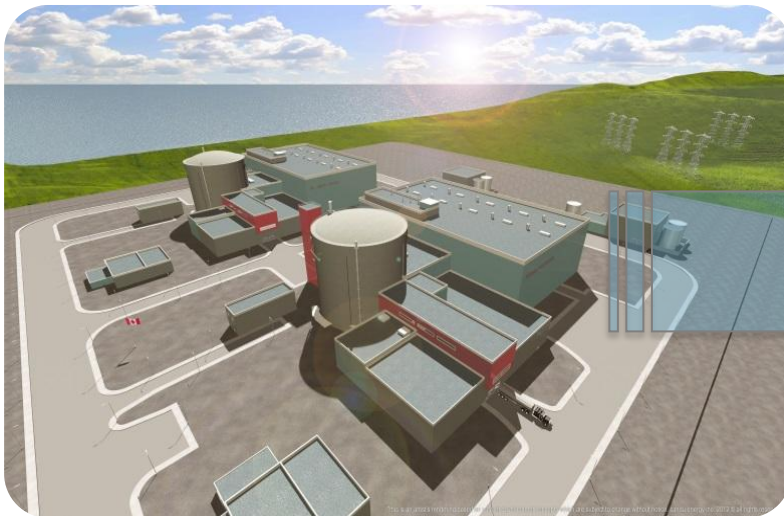
Only proven medium sized reactor

20% more efficient user of uranium than LWRs

Unique fuel cycle capabilities

Cobalt-60 production

Proven high performer – 92% target CF



EC6® Post Fukushima Safety Advantages

Larger Design Margins

- Beyond Design Basis Accidents to prevent cliff edge effects

Multiple Defense-in-Depth Layers

- Emergency Heat Removal System (EHRS)
- Severe Accident Recovery & Heat Removal System (SARHRS)

Beyond Design Basis Seismic Events

- Designed for up to 0.3g PGA for Design Basis Event (DBE) hence larger seismic margins

Containment Enhancements

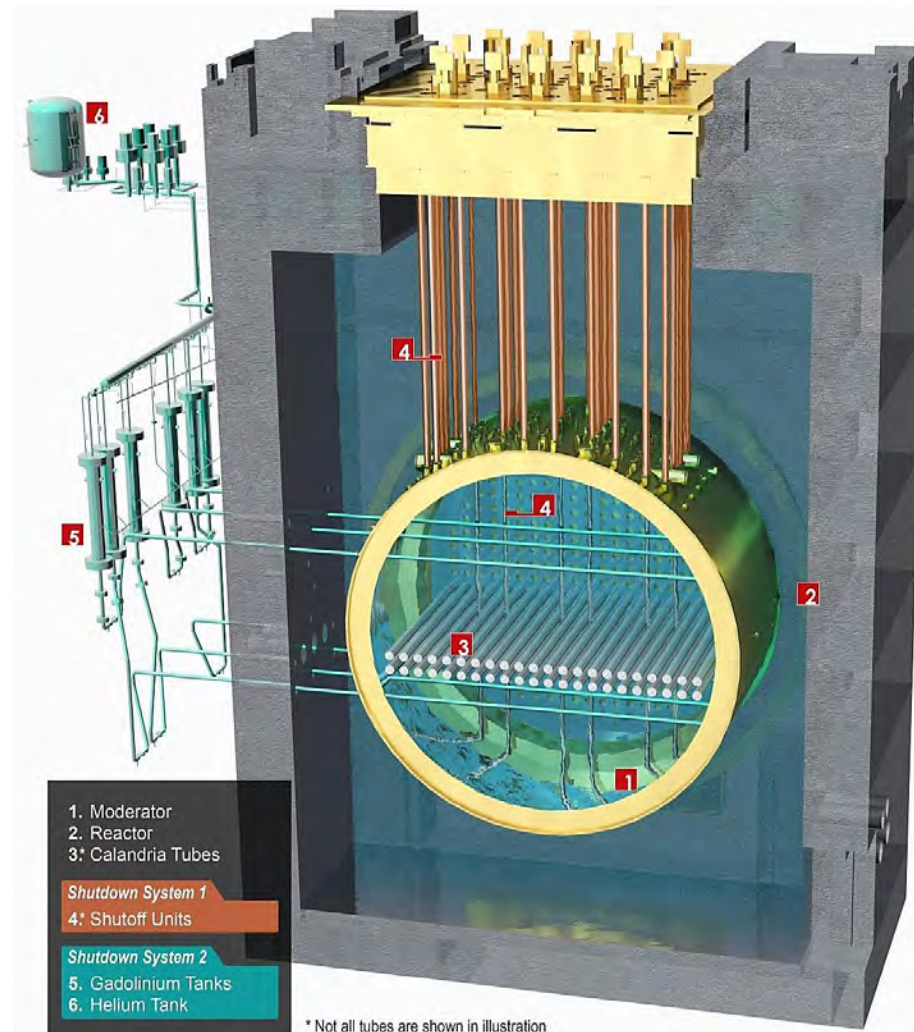
- Robust and large commercial aircraft impact resistant
- PARs for hydrogen control

Prolonged Station Blackout

- Extended battery life to 24 hours
- 5 days passive core cooling via thermo-syphoning
- Multiple connection points for mobile power cooling water sources

Inherent Safety Features

- Low power density of the fuel
- A large number of heat sinks (water) relative to LWRs
- Passive cooling features that do not require external power



CANDU® Fuel Cycle Flexibility

The utilization of advanced fuel cycles is a key differentiator for CANDU technology from other reactor types

Recycled Uranium (RU) fuels:

- RU-based fuel has been qualified and demonstrated in CANDU reactors
- Natural Uranium Equivalent (NUE) is a fuel mixture RU and Depleted Uranium (DU)
- Direct use of Recycled Uranium (DRU) fuel for the Advanced Fuel CANDU Reactor (AFCR™)

Low Enriched Uranium (LEU)/Thorium (Th) fuels:

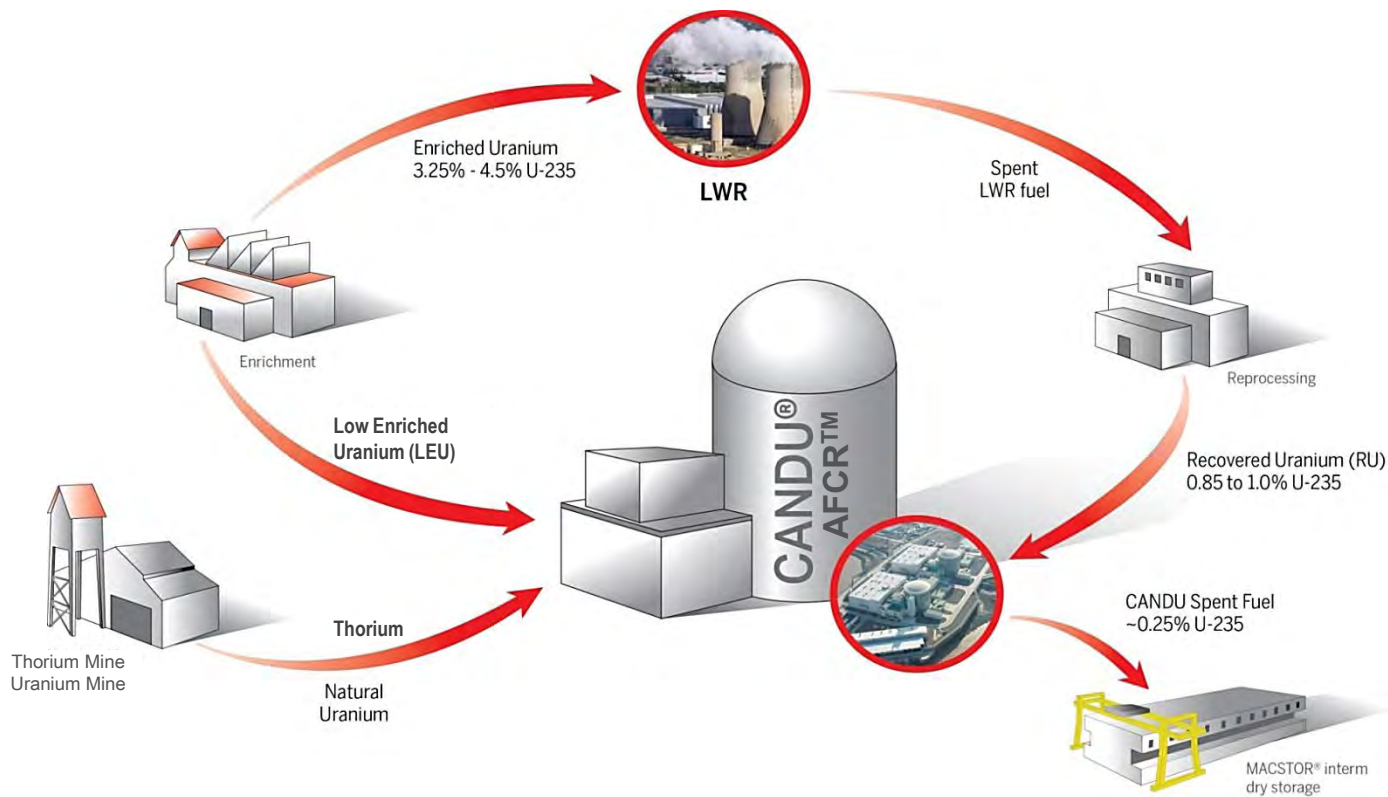
- Thorium based fuels for the AFCR have been demonstrated through R&D and testing

Mixed Oxide (MOX) fuels:

- CANMOX™ option is a design adaptation of EC6® to burn MOX fuel for UK plutonium disposition



Advanced Fuel CANDU® Reactor (AFCR™)



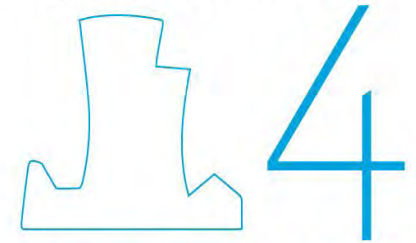
Recovered Uranium (RU):

- 90,000 ton manufactured to date (4,000 ton/yr production)
- Average ^{235}U content is ~0.95%

Thorium:

- Abundant “fertile” material
- Globally well distributed and more available than NU
- Superior material properties

Spent fuel from



LIGHT WATER REACTORS

Can be reused to fuel



Generating enough new electricity to power more than

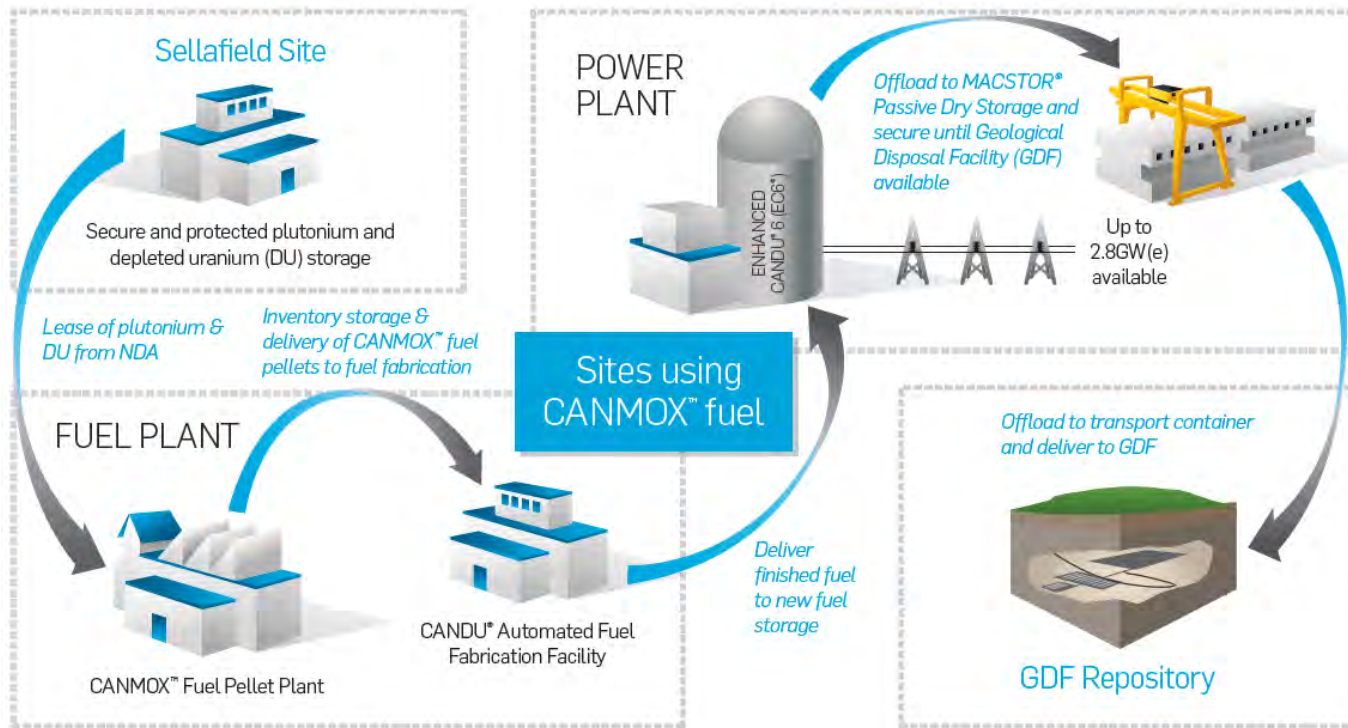


SNC • LAVALIN

Candu®
An SNC-Lavalin Technology

- Copyright -
© [2015] SNC-Lavalin Inc. and its member companies. All rights reserved. Unauthorized use or reproduction is prohibited.

EC6® CANMOX™



THE UK'S



140

TONNES

of plutonium can power

5,000,000



HOMES

FOR 30

YEARS

in 4 MOX-ready EC6

nuclear reactors while

REDUCING

PLUTONIUM

STOCKPILE

to 100% proliferation

resistant material



SNC • LAVALIN

Candu®

An SNC-Lavalin Technology

- Copyright-

© [2015] SNC-Lavalin Inc. and its member companies. All rights reserved. Unauthorized use or reproduction is prohibited.

Products for CANDU® and LWR Reactors

- Hydrogen Recombiners
- Waste Management Solutions
- Nuclear Pump Seals
- Emergency Core Cooling (ECC) Strainers
- Advanced Control Center Information System



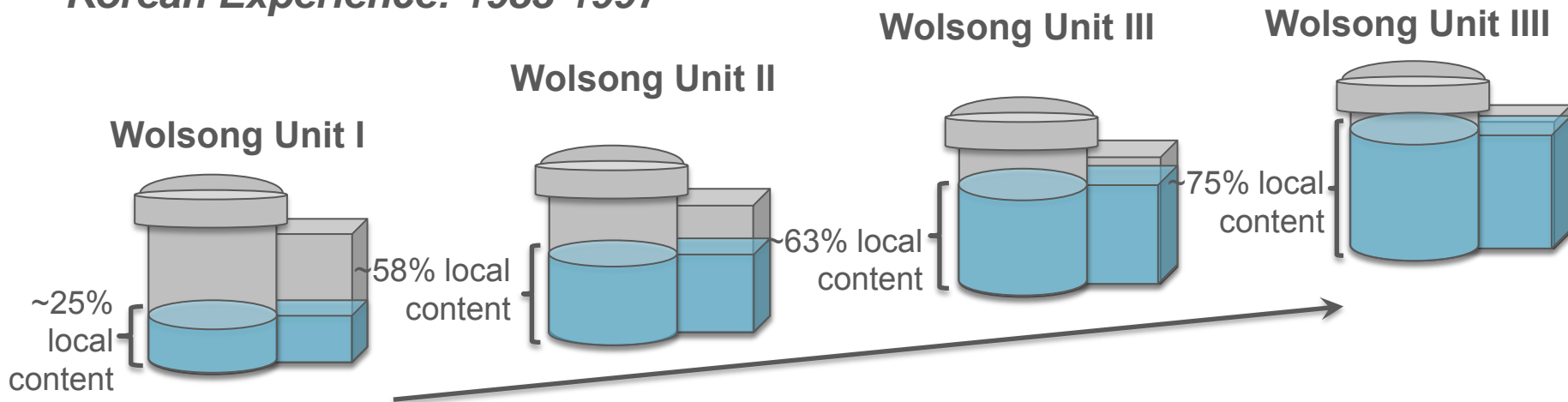
Technology Transfer and Localization Program

Unique CANDU design allows for the highest degree of local content

Most effective program of its kind → Achieves the highest level of local content with the fewest units

Partnerships are enhanced through the skills and the technology: program supports industrial development in emerging economies

Korean Experience: 1983-1997



CANDU in SE Europe: Recycled Uranium (RU) fuel for Cernavoda 1 and 2

Use France/UK sourced RU:

- Reprocessed CANDU fuel from C1/2 for fissile material and DU
- Reduce high level waste;
- Burn actinides (long-lived waste)
- Can be implemented in the relative short term

AFCR for Europe

Nuclear in SE Europe:

- Ukraine; Slovakia; Hungary; Romania; Bulgaria; Turkey

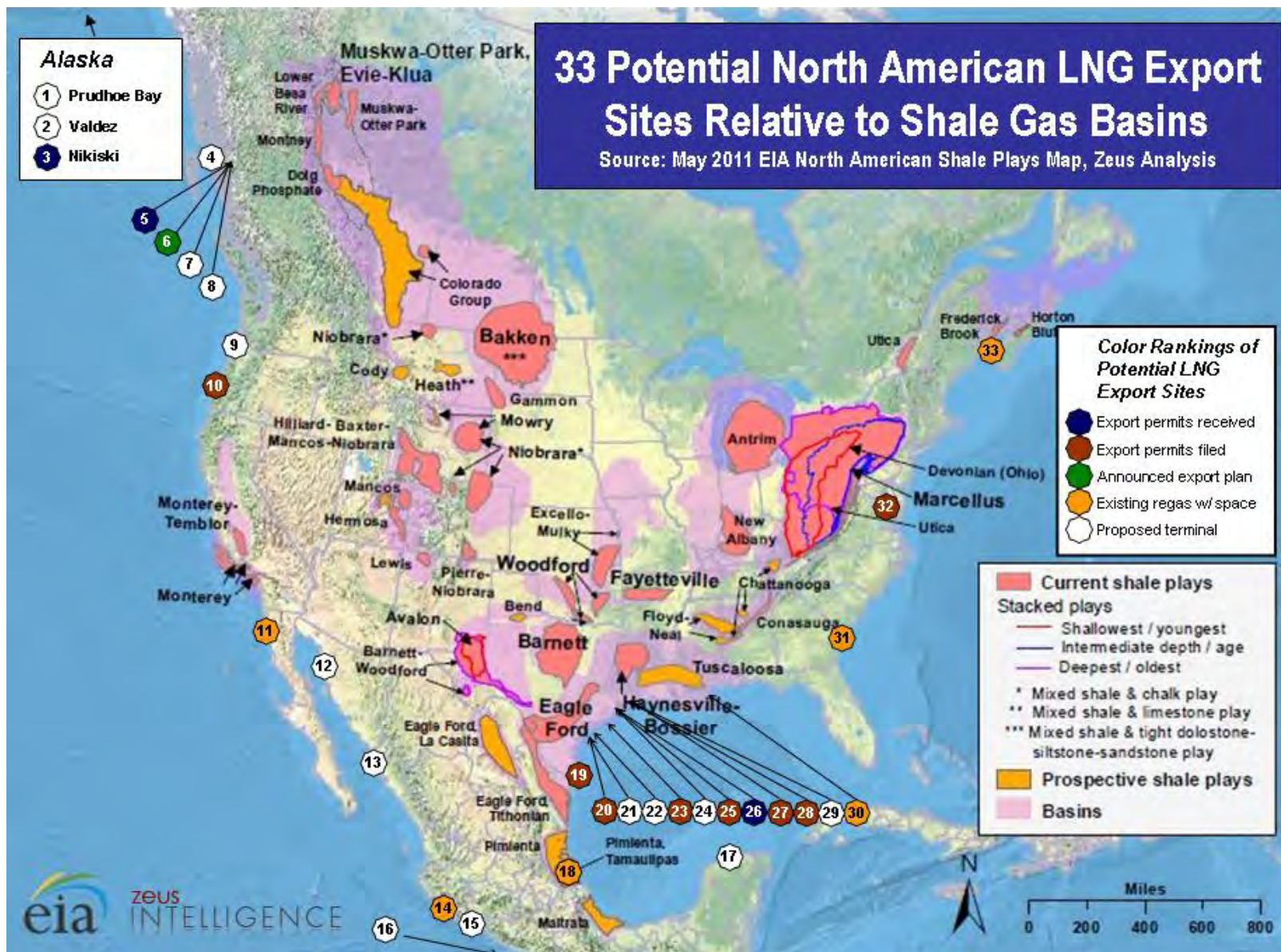
Challenges facing SE Europe

- Will North American LNG completely revolutionise the European NG market?
- Will Tesla make renewables (and nuclear!) the most attractive options for the future?
- What about climate change and the need to reduce significantly CO2 emissions? NG helps but is only a transitory solution;
- Impact of CO2 taxes: will coal be eliminated in the next couple of decades?
- Will electricity consumption grow? Yes..... Air conditioning; desalination; irrigation; transportation

Disruptive developments



For bigger applications, Tesla offers the refrigerator-esque Powerpack. Nathaniel Wood/WIRED



Conclusion

SNC-Lavalin is a full nuclear technology company leveraging the expertise and experience of AECL to deliver global nuclear solutions.

The EC6 Reactor is a Generation III and proven technology that can offer unique attributes to prospective clients

The unique attributes of the CANDU reactor make it well suited for countries looking to achieve energy independence

There is a special role for CANDU reactors in Europe and more specifically in SE Europe

