



ORGANIZATION OF
CANADIAN NUCLEAR
INDUSTRIES

Clean Energy for a Low Carbon Economy

Overview of Canadian SMR Market

4th International Nuclear Conference

April 2025

Presented By : Brian Fehrenbach

About OCNI

The Organization of Canadian Nuclear Industries (OCNI) represents a broad range of Canadian nuclear suppliers.

250 Canadian member companies /

10 International members in 4 Countries /

Nuclear Fission

Medical Isotopes

Advanced Manufacturing

Nuclear Fusion

Hydrogen

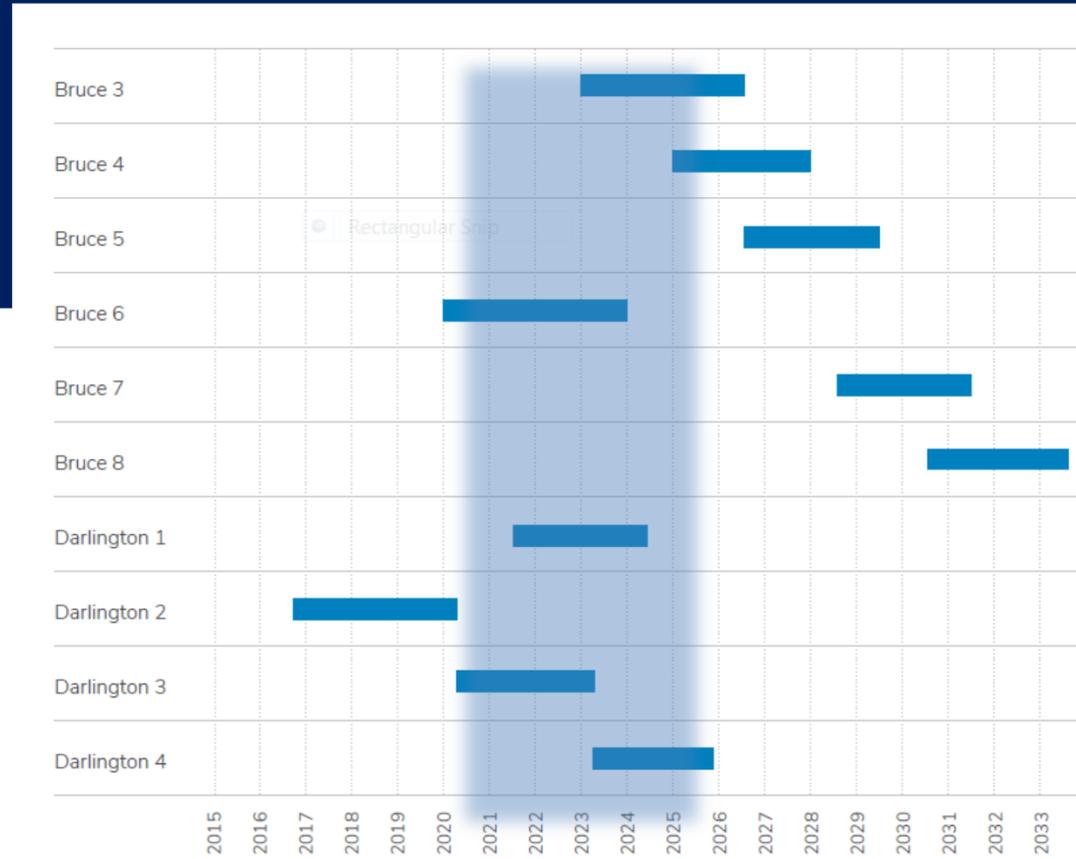




ORGANIZATION OF
CANADIAN NUCLEAR
INDUSTRIES

Clean Energy for a Low Carbon Economy

Ontario's Refurbishment Success = Social License



Darlington Site Layout

1 Darlington Energy Complex	10 Heavy Water Management Building
2 Operations Support Building	11 Re-tube Waste Processing Building
3 Re-tube and Feeder Replacement Island Support Annex	12 Third Emergency Power Generator
4 Refurbishment Project Office	13 Containment Filtered Venting System
5 Vehicle Screening Facility	14 Powerhouse Steam Venting System
6 Hilt Road Interchange Improvements	15 Shield Tank Overpressure Protection
7 Site Electrical Power Distribution System Upgrades	16 Emergency Service Water
8 Auxiliary Heating Steam Facility	17 Re-tube Waste Storage Building
9 Water and Sewer	18 Darlington Waste Management Facility

● Safety Improvement Projects
 ● Refurbishment Projects
 ● Site Infrastructure Projects

Ontario's successful nuclear refurbishment:

- Total capital cost \$25B (2017 CAD) for 10 CANDU reactors
- Projects will generate \$19.4B towards Ontario's DGDP over 30 years and support more than 20,000 jobs annually
- Projects are ahead of schedule and on budget which contributes to the social license for more nuclear projects

Canadian SMR Support

2018 SMR

Road Map

2019 Provincial MOU with Saskatchewan, Ontario and New Brunswick (Alberta signed in 2021)

2020 SMR Action Plan

2022 OCNI Launches 1st Ready4SMR Program in New Brunswick

CANADIAN SMR Excellence



**CANADA HAS AGREED ON
AN INTEGRATED APPROACH
TO A NATIONAL ROLL-OUT OF SMRs.**

STREAM 1

- First grid-scale SMR of 300 MW to be built by Ontario Power Generation by the end of the 2020's
- Subsequent units in Saskatchewan in the 2030's

STREAM 2

- Target date: 2030s – ARC Clean Energy and Moltex Energy Canada deploy two 4th Gen advanced SMRs at Point Lepreau Nuclear Generating Station, New Brunswick.
- Terrestrial Energy and X-Energy are other Stream 2 choices

STREAM 3

- 5MW Global first power gas-cooled fast reactor demonstration unit at Chalk River Nuclear Laboratories underway. Expected completion: 2026
- Westinghouse's micro SMR is another Stream 3 choice



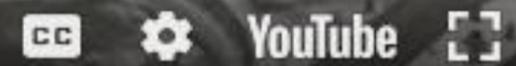


Forebay Pumphouse

Reactor Building Shaft

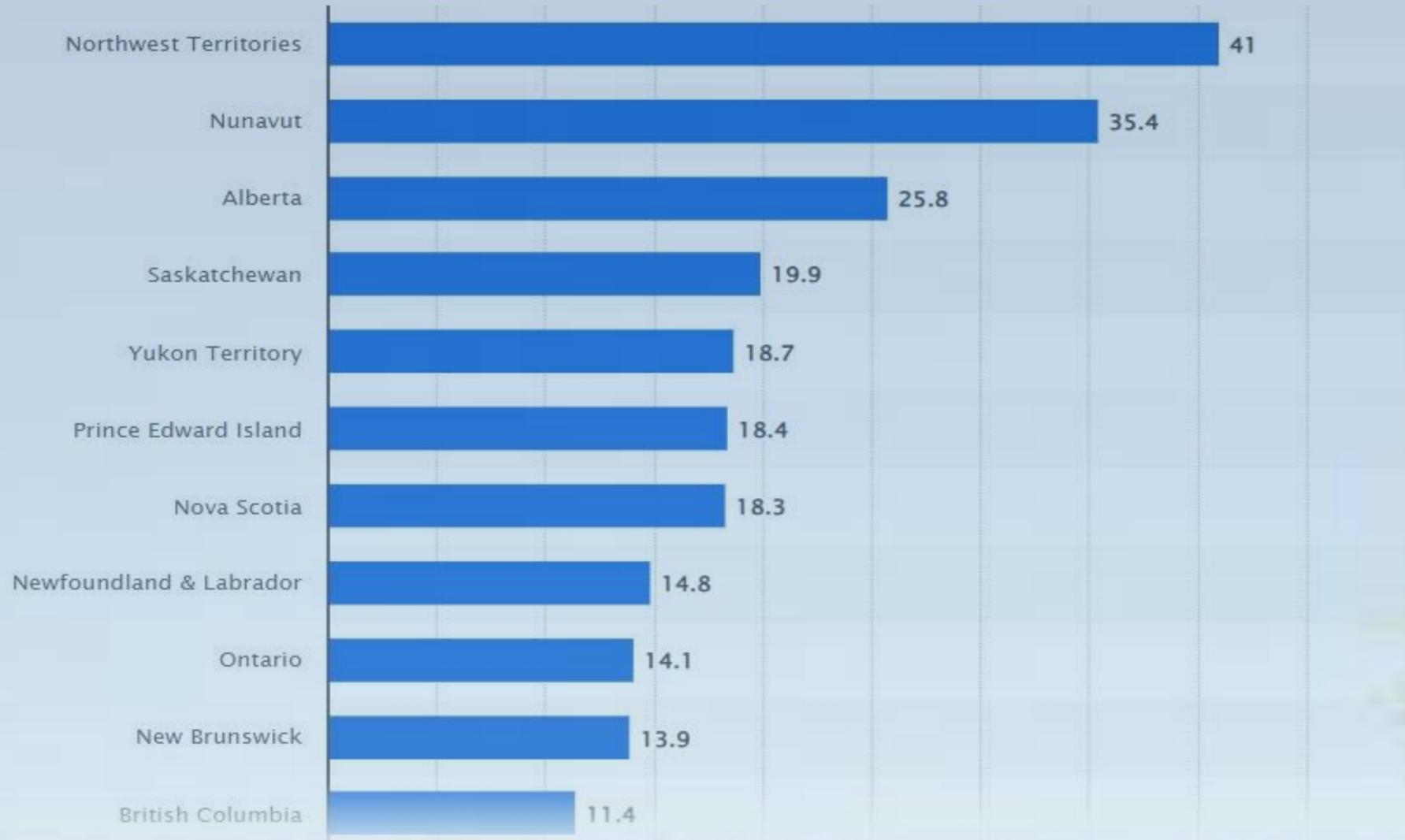
Launching Shaft

✔ **Marine Works – boreholes :**
Started 5th of June
Completion 5th of August 2024



Canadian 2023 Electricity Statistics

(in Canadian cents per kilowatt-hour)



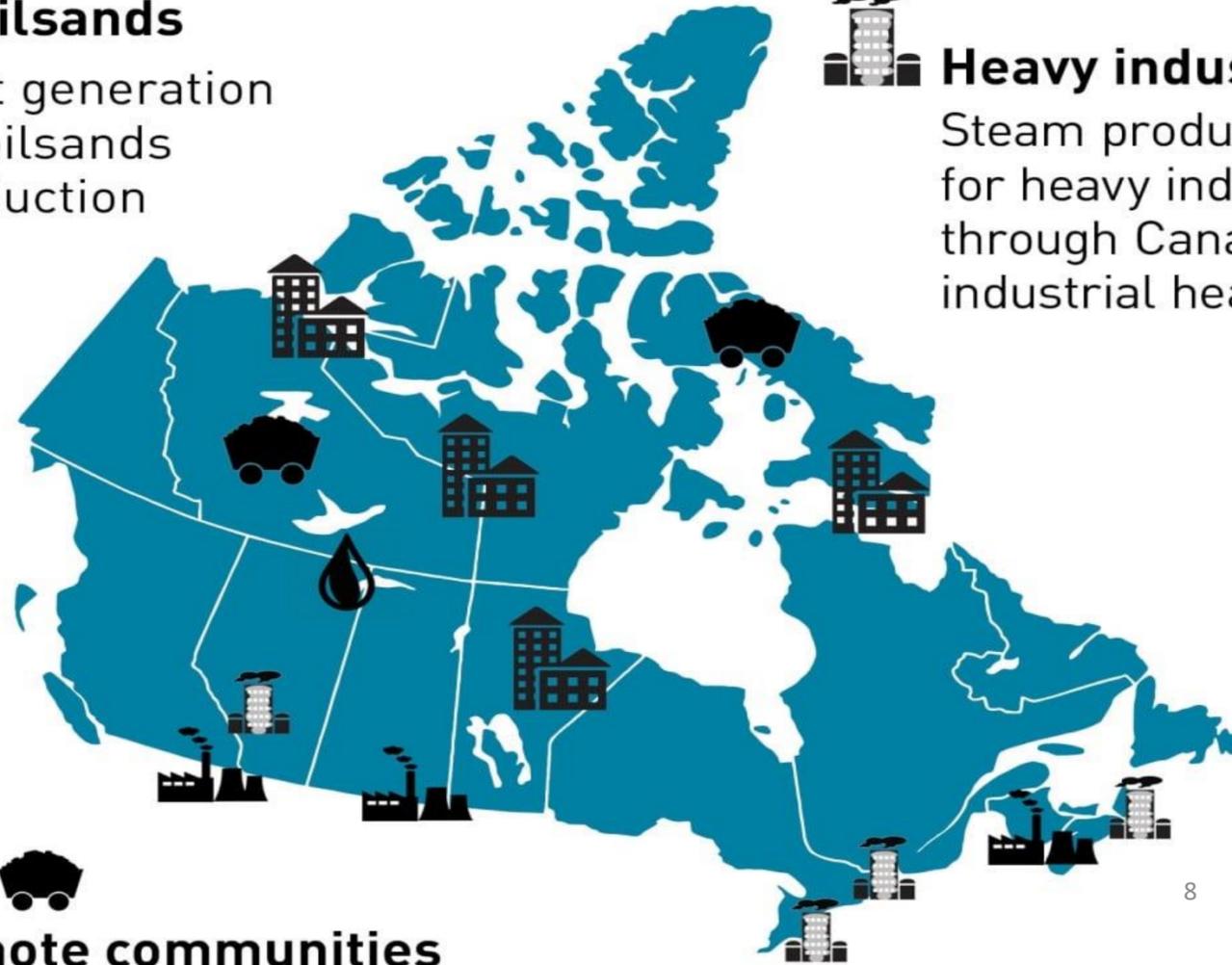
Oilsands

Heat generation for oilsands production



Heavy industry

Steam production for heavy industry through Canada's industrial heartland



Remote communities and mines

Power generation for some 170 northern remote and Indigenous communities plus dozens of off-grid mining sites currently dependent on polluting, GHG generating diesel



Conventional coal-fired power:

Replacement of 17 coal-fired power stations across the country that produce approximately 65 megatonnes of CO2 annually

Economics

Each SMR Built in Canada would:

- Increase GDP by approximately CAD \$3.8B and provide 500 jobs annually over 65 years
- Generate approximately CAD \$4.9B in all levels of tax revenues over 65 years
- Provide an economic multiplier of 0.82 over the lifespan of the technologies

And, each SMR can prevent between 0.3 and 2 megatons of CO2 emissions annually, depending on location and utilization.

Canadian Advanced SMRs

eVinci Microreactor

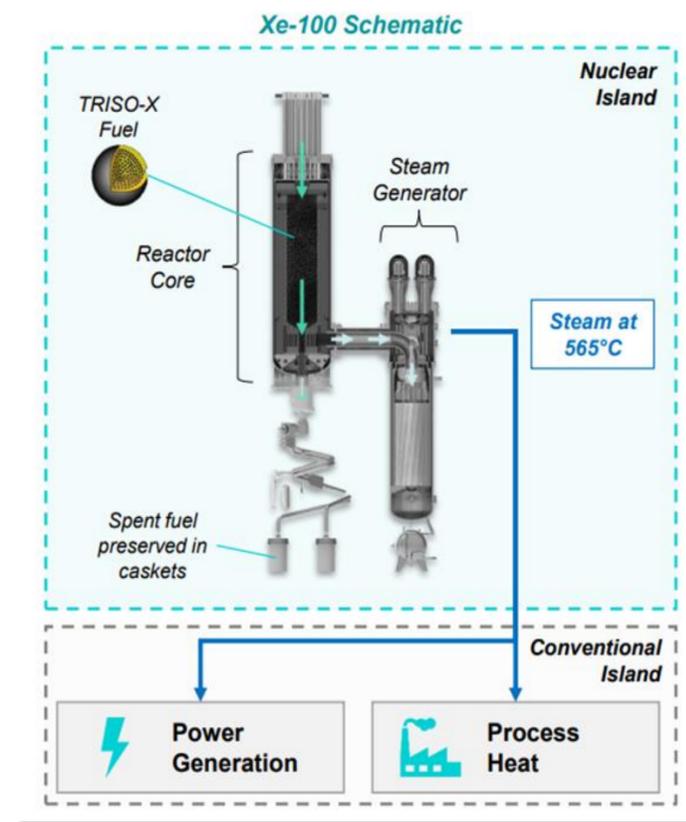
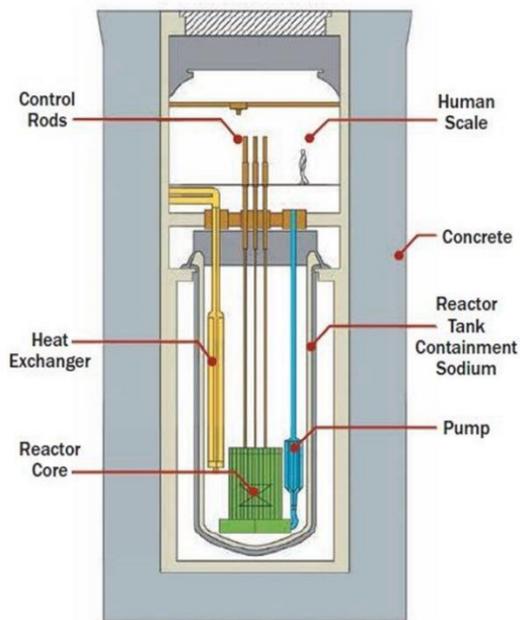
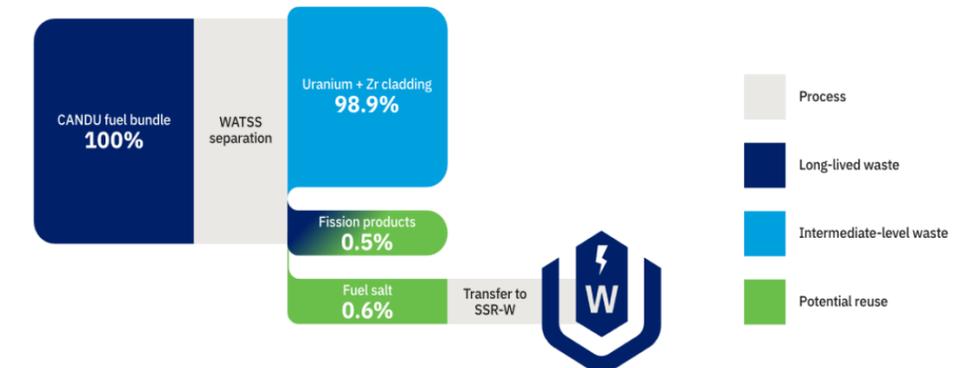
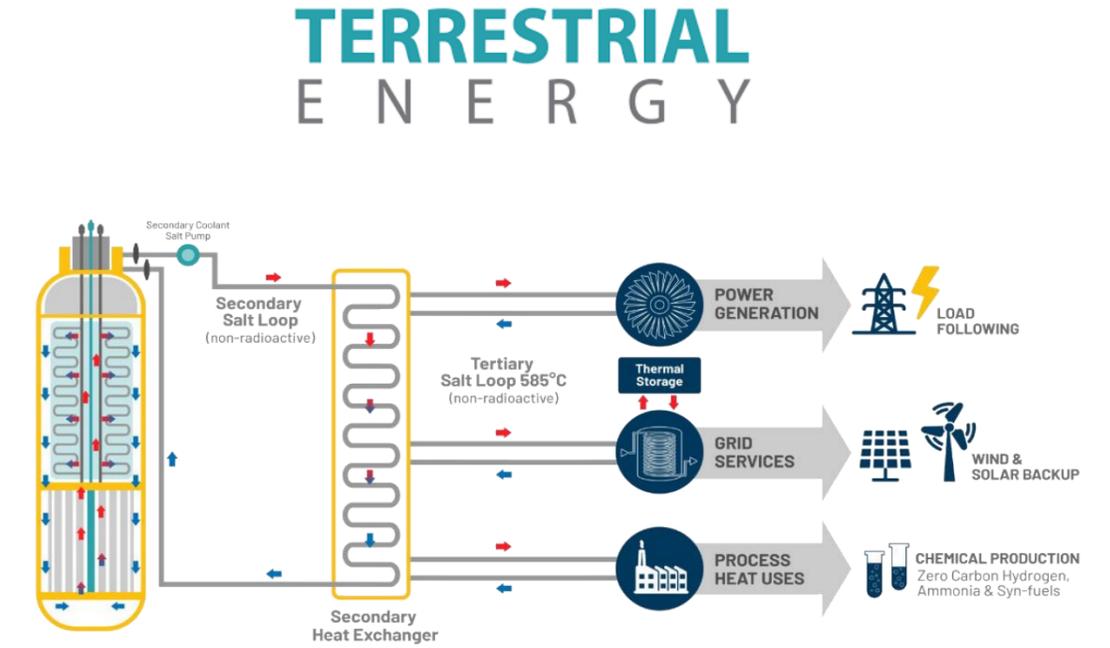


FIGURE 6
Advanced Reactor Concepts'
ARC-100 Power Module

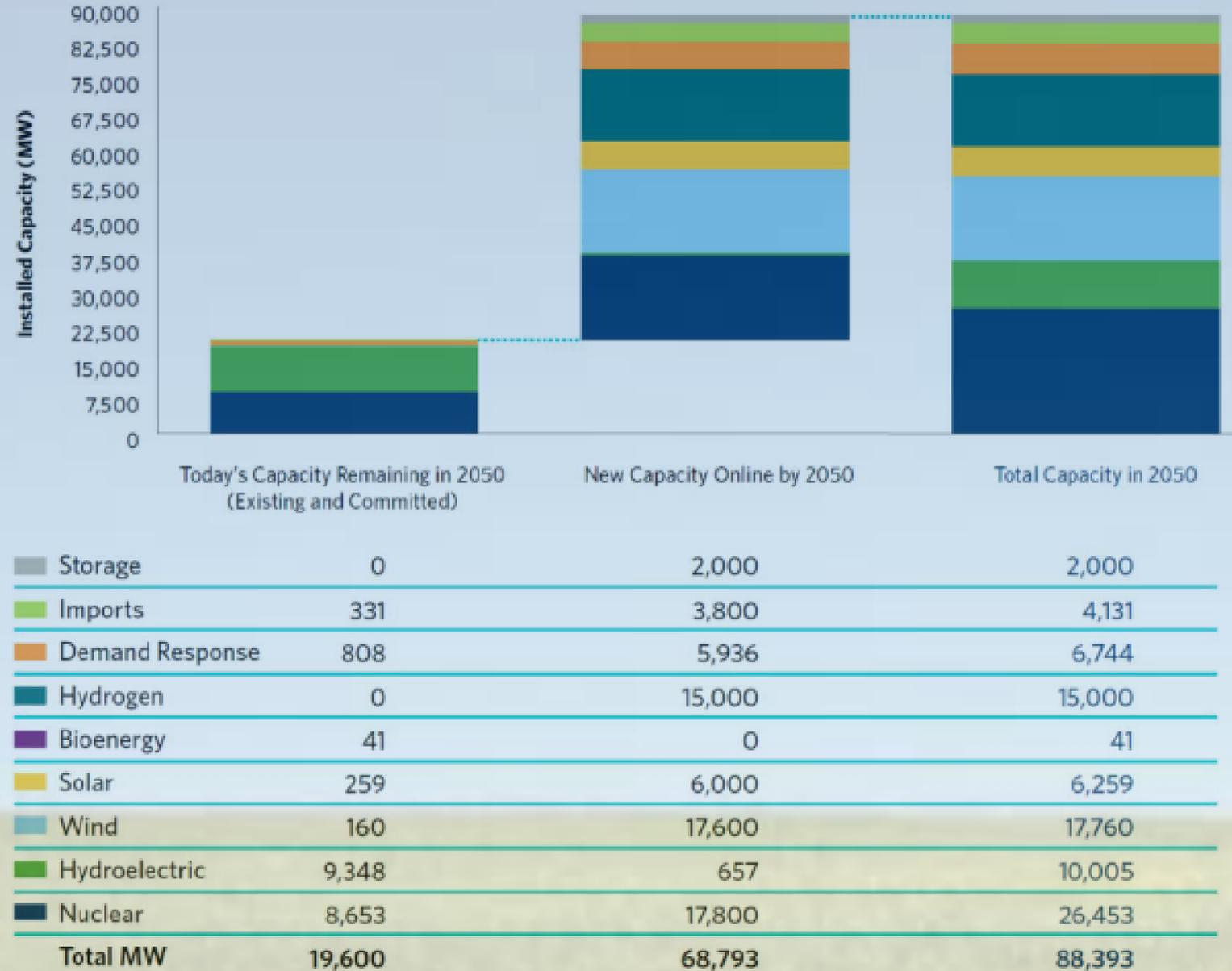


Source: © Advanced Reactor Concepts, LLC



Ontario's Nuclear Growth

Figure 12 | Pathway Scenario - Installed Capacity in 2050



Source: IESO's Pathways to Decarbonization Report,



The image features a network diagram with five blue circular nodes connected by a web of white lines. The nodes are arranged in a roughly circular pattern. The background is a blurred night cityscape with lights from buildings and streets. The overall color palette is dominated by blues and whites, with the city lights providing a warm, yellowish glow.

OCNI

CAPACITY

ADVOCACY

CONNECTION

**GLOBAL
REACH**

www.ocni.ca