

## PRESENTATION CONTEXT & DISCLAIMER

These slides were prepared for a 30-minute keynote address at Smart Energy Halifax, April 15, 2026.

They are designed to be viewed in conjunction with a live presentation and spoken commentary — they do not stand alone as a complete or self-explanatory document.

**This presentation may contain errors, omissions, or information that has become outdated.** The data centre, energy, and AI sectors are moving rapidly. Statistics, policy references, regulatory frameworks, and case study details were accurate to the best of the presenter's knowledge at the time of preparation but may have changed. The Logic report referenced is dated April 8, 2026. JLARC Virginia data is from December 2024. CBRE rankings are from the 2025 Scoring Tech Talent report. Health cost estimates for NOx emissions are from a UC Riverside/Caltech academic preprint, not a government finding, and should be interpreted accordingly.

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If you are viewing these slides without the accompanying talk, the speaker notes and full source documentation are available at [francissyms.com/resources](https://francissyms.com/resources).

*Francis Syms, P.Eng. — April 2026*

# The Truth About DATA CENTRES IN YOUR COMMUNITY

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Associate Dean, ICT  
CBC Technology Columnist



# Humber by The Numbers



One of Canada's  
Largest Polytechnics

6



Academic Faculties



210  
Programs



147,000+  
Full-time Program  
Applications Annually



66,078  
Students



36,400+  
Domestic



27,500+  
International students  
from 138 countries



2,000+  
Apprenticeship



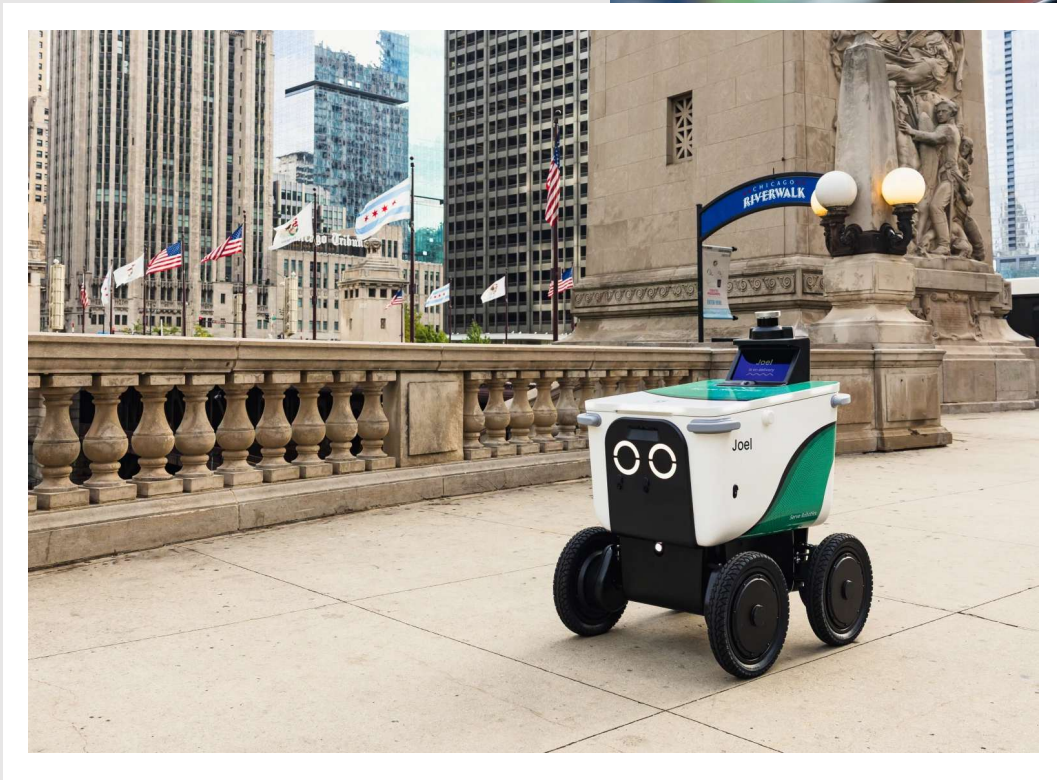
315,000+  
Alumni



10,000+  
Graduates annually









# The Maritimes have a window to lead this.

NS, NB & PEI – ONE INTERCONNECTED GRID, ONE MOMENT TO GET THIS RIGHT.

**#2**

Emerging Tech  
Market  
in North America  
(CBRE)

**80%**

NS clean electricity  
target by 2030

**100%**

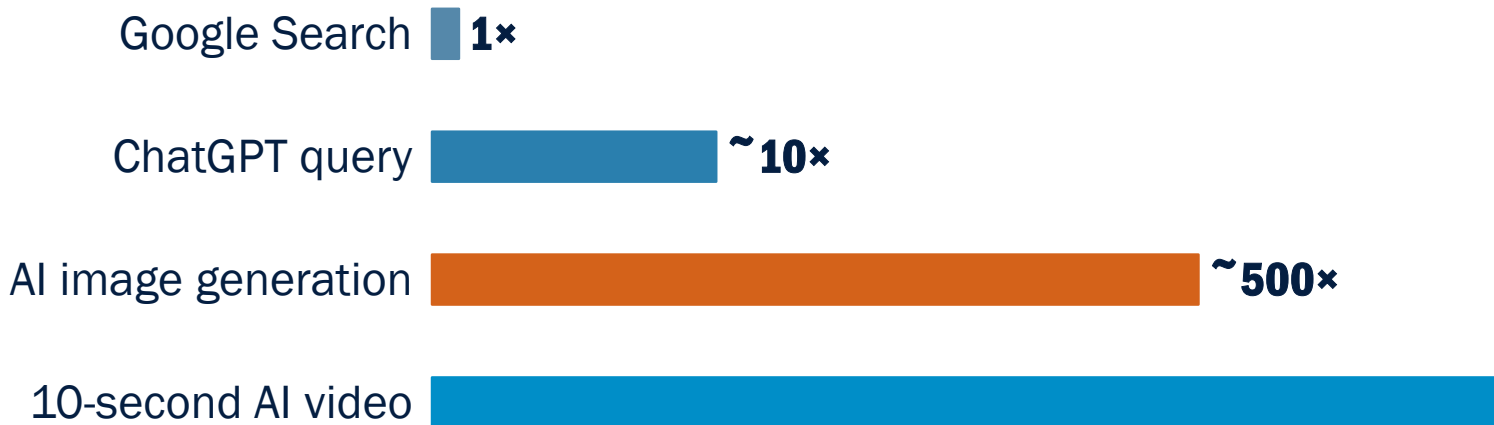
PEI renewable  
target by 2030

**660MW**

NB nuclear  
baseload  
(Point Lepreau)

## THE FUEL BEHIND THE BOOM

**AI doesn't just use electricity. It requires it at a scale we've never planned for.**



*Every AI interaction demands power. Multiply by billions of queries per day.*

Source: McMaster University / Calic; IEA Energy and AI 2025

Every Query has a Cost

One ChatGPT query lights 25 bulbs. A Google search barely flickers one.



● ChatGPT

Waiting for input...

Energy: 0.000 Wh

You

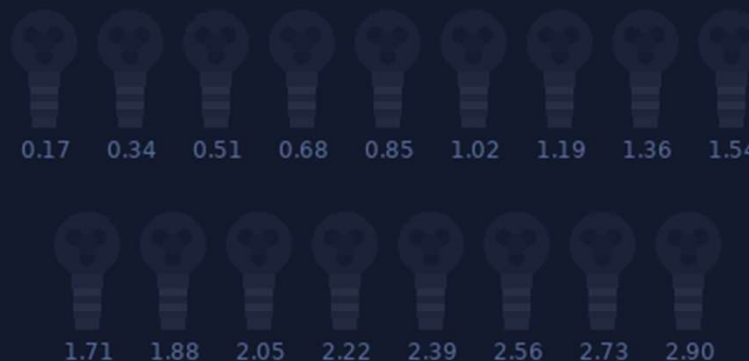
● ChatGPT

Energy this query:  
**0.000 Wh**

### Energy visualised

Each bulb = ~1 min of a 10W LED (0.17 Wh)

**0.000** Wh



Google search = 0.3 Wh (about 1 bulb)

Sources: Google Environmental Report; IEA (2024) | ChatGPT ~2.9 Wh/query | Google ~0.3 Wh/query | ~10x more energy

Every Query has a Cost

One ChatGPT response fills a 500 ml water bottle. A Google search is a shot glass.



● ChatGPT

Waiting for input...

Water: 0 ml

You

● ChatGPT

Water this query:  
**0 ml**

### Water consumption visualised

1 conversation  $\approx$  1  $\times$  500ml bottle for cooling

0

ml



Google search  $\approx$  0 ml (cached, no GPU needed)

Source: Ren et al. 2023 'Making AI Less Thirsty' |  $\sim$ 500ml per ChatGPT conversation | Data centre cooling water

# It starts with a single device

## Step 1: Your Computer

Everything starts here — one device, one user, one request

PC > Server > Rack > Data Centre

### What your computer does:



Your laptop sends a question over the internet.  
The heavy lifting happens somewhere else  
entirely.

Your device  
**0W**  
typical laptop

Users served  
**1**  
just you

# A server does the work — for thousands at once

## Step 2: The Server

PC > **Server** > Rack > Data Centre

One machine serving thousands of users simultaneously



Power draw  
**0W**  
one server unit

Users served  
**1**  
simultaneously

Key insight  
**Same job as your laptop.**  
But for thousands of people at once.

How it differs from your laptop:

A server is a computer with no screen or keyboard, running 24/7, answering thousands of requests simultaneously.

# Stack 20 servers — now you have a rack

## Step 3: The Server Rack

PC > Server > Rack > Data Centre

Stack 20 servers in a metal cabinet — now you have a rack

One rack draws ~8 kW of power — roughly the same as 8 households. A data centre holds thousands of racks.



0 of 20 servers installed

Power draw  
**0.0 kW**  
per rack (8 homes)

Users served  
**0**  
per rack

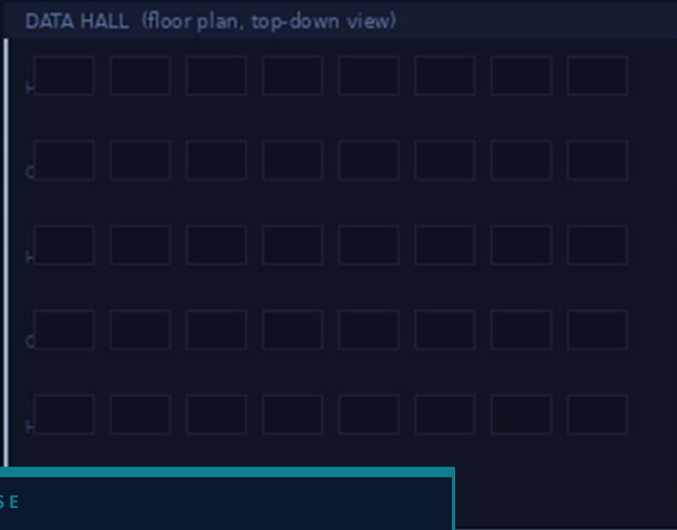
Physical size  
**~2m tall · 0.6m wide · 1m deep**  
About the same footprint as a parking space

# Multiply the racks — and you need a power station

## Step 4: The Data Centre

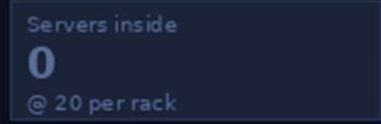
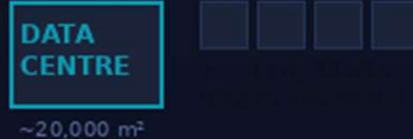
Thousands of racks. Enough power for a small city.

PC > Server > Rack > Data Centre



### How big is this?

One large data centre =



**WATER USE**

# ~125,000 L / hour

150 MW facility · IEA (2024)  
= an Olympic pool every 20 hours

One large facility needs 150+ MW — equal to 131,000 Maritime homes — and covers 4 city blocks.

## CANADA'S DATA CENTRE BOOM – THE LOGIC, APRIL 2026

### "Energy, not climate, is the advantage – and the constraint."

*The Logic, April 8 2026 – after finding every data centre in Canada*

**309**

data centres found  
in Canada total

**\$19–34M**

per megawatt to  
build  
an AI data centre

**112**

in Ontario – over a  
third of Canada's  
total

**33 → 3**

Alberta: 33 proposals  
Only 3 approved  
(1.2GW)

#### **Atlantic Canada**

*"Facilities are few and typically small, older builds. Many are run by telcos. The exception is New Brunswick, where a dense network of unused fibre-optic cable has captured the attention of Beacon AI and VoltaGrid."*

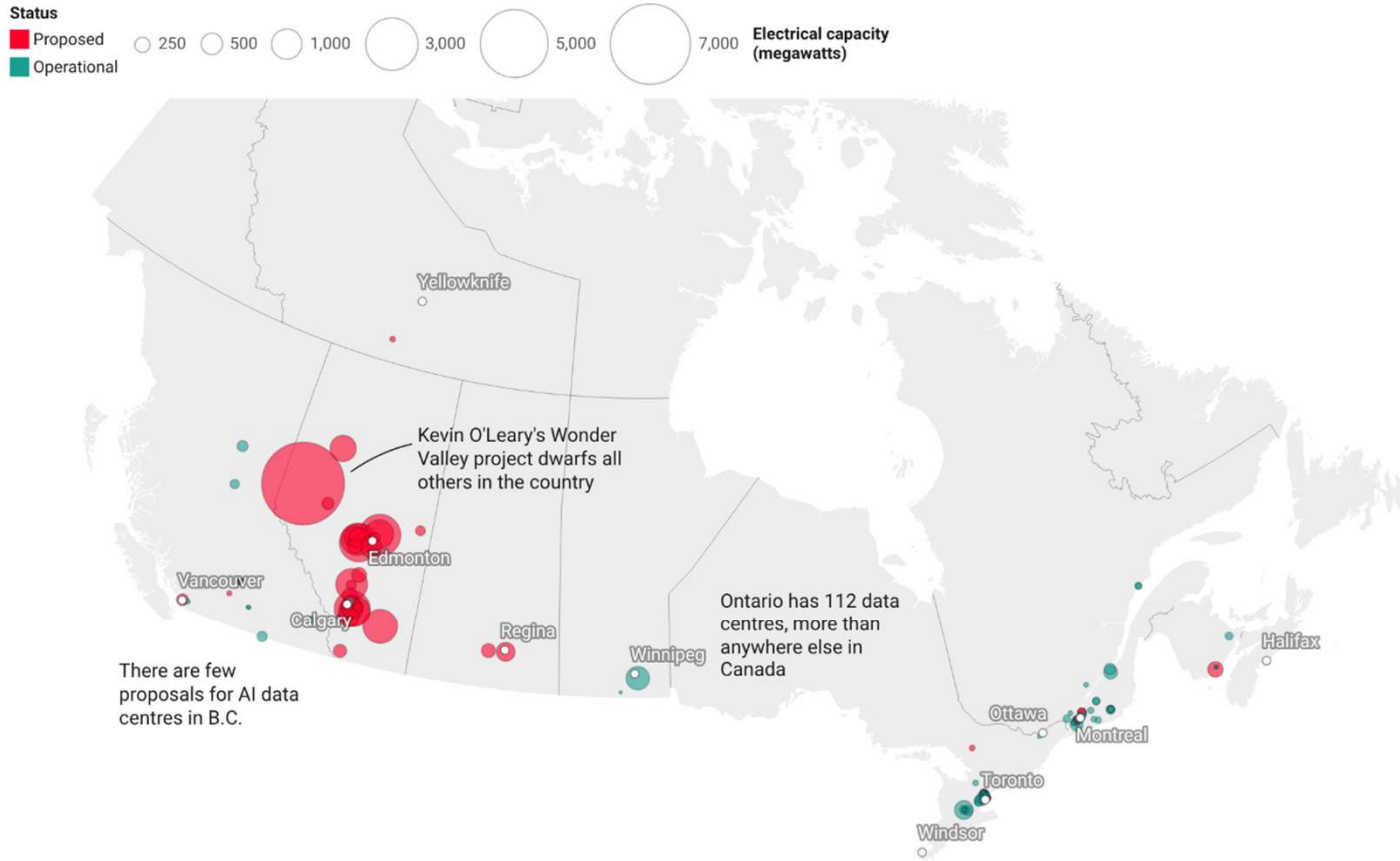
Source: The Logic, 'We Found Every Data Centre in Canada', April 8 2026

Humber School of Clean Energy

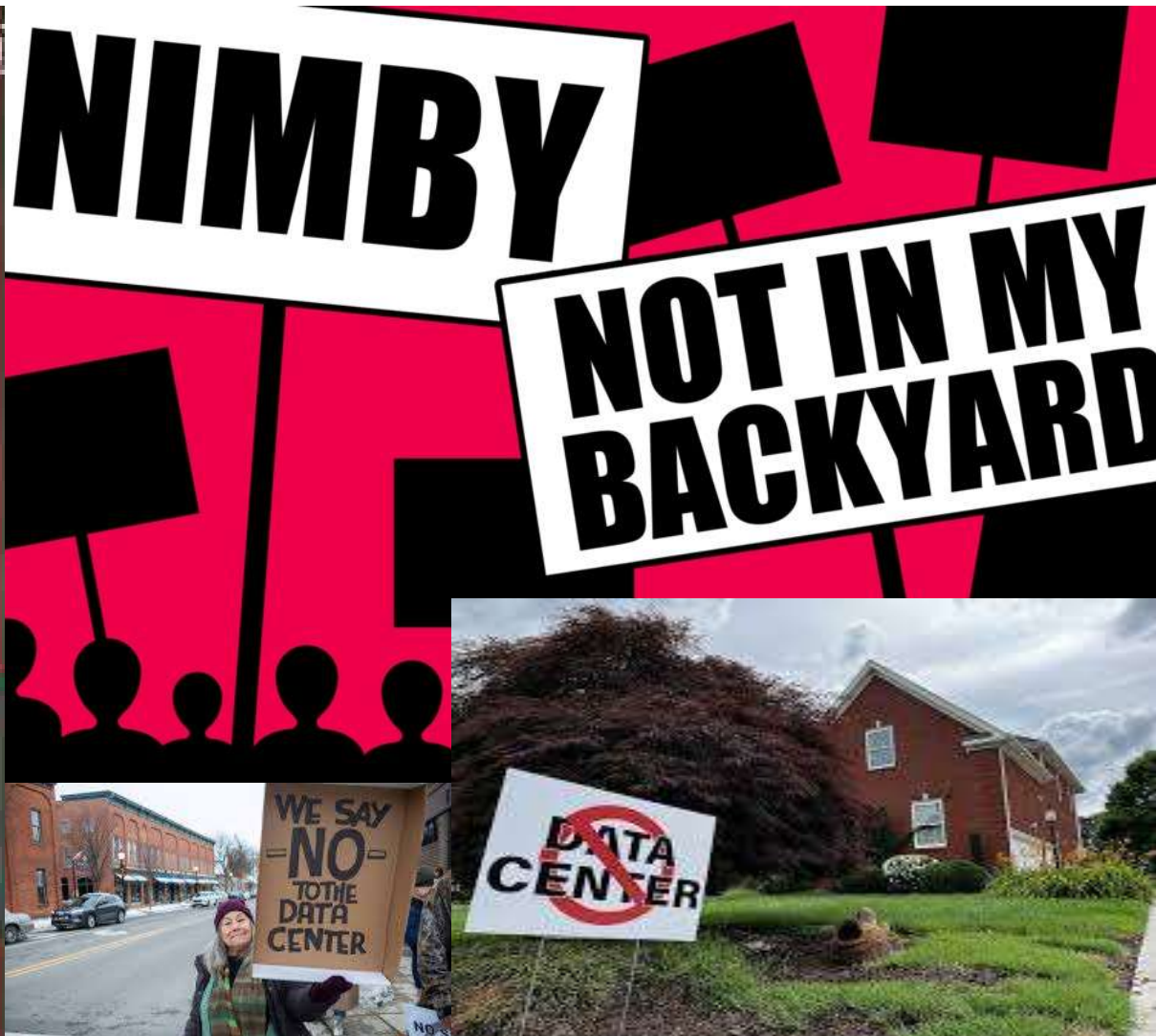
Francis Syms | Humber Polytechnic

# Canada's data-centre-building boom is all about Alberta

Legacy data centres dominate near Toronto and Montreal, with proposed sites in Alberta dwarfing anything ever seen



Note: This map includes only data centres for which capacity data could be confirmed through publicly available records.  
Source: The Logic, datacentremap.com, Statistics Canada • Created with Datawrapper



# PERSON OF THE YEAR | THE ARCHITECTS OF AI

# TIME



# PERSON OF THE YEAR | THE ARCHITECTS OF AI

# TIME





8

people on that beam.

---

7 of 8 are men

All are from Silicon Valley or adjacent

**None are from the communities AI most effects**

*Who should have a seat at the table when AI decisions are made?*



⌵ PRESIDENTIAL ACTIONS

# PREVENTING WOKE AI IN THE FEDERAL GOVERNMENT

Executive Orders | July 23, 2025

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered:

Section 1. Purpose. Artificial intelligence (AI) will play a critical role in how Americans of all ages learn new skills, consume information, and navigate their daily lives. Americans will require reliable outputs from AI, but when ideological biases or social agendas are built into AI models, they can distort the quality and accuracy of the output.

# WHY THE MARITIMES ARE A SERIOUS DATA CENTRE DESTINATION



**The Maritimes have real advantages. The job is using them.**

## Structural advantages

- #2 Emerging Tech Market in North America
- Transatlantic fibre connectivity
- Canadian data sovereignty laws

## The clean energy pipeline

- 1,000MW+ new onshore wind underway
- Offshore wind call for bids underway (5GW 1<sup>st</sup> round). NB nuclear baseload (660MW).
- Green Choice PPAs available

## What getting ready looks like

- Match new load to new generation
- NS IESO takes over grid planning in 2026
- Federal sovereign AI data centre program

# WHAT EVERY MARITIME COMMUNITY SHOULD UNDERSTAND

## Jobs: Real vs. Headline

- A \$1B facility may employ 50–200 people long-term
- Construction workers often come from outside the region
- Get binding local hiring commitments in writing before approval

## Rates & Infrastructure

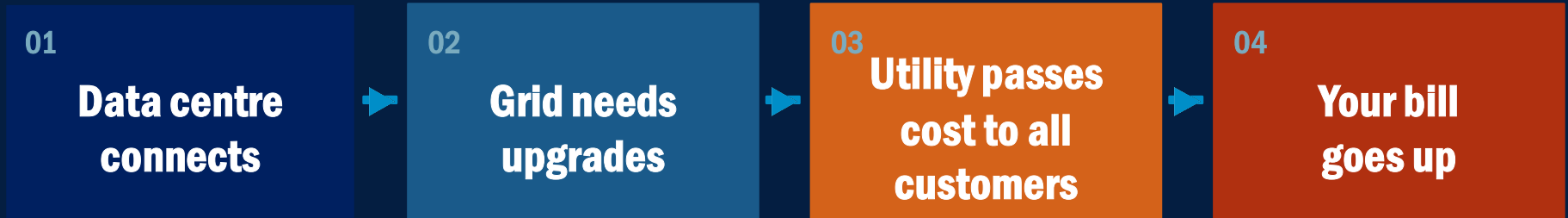
- Grid upgrade costs can flow to existing ratepayers
- US communities saw bills rise up to 267%
- The developer must fund grid upgrades — not NS or NB Power customers

## Water & Environment

- Evaporative cooling: millions of litres per day
- Communities have the right to know water impact before approval
- Closed-loop cooling should be required in water-stressed areas



# HOW A DATA CENTRE LANDS ON YOUR POWER BILL



VIRGINIA

**+\$444/yr**

per household  
projected by 2040 (JLARC)

IRELAND

**+€100/yr**

per household  
actual in 2024

**The fix: require the developer to fund grid upgrades. Not ratepayers.**

# POWER USAGE EFFECTIVENESS – EXPLAINED

$$\text{PUE} = \text{Total facility power} \div \text{IT equipment power}$$

Lower is better. 1.0 = perfect (physically impossible). Every watt above 1.0 is wasted on cooling.

## 1.2

**Best in class**

Singapore & Amsterdam  
requirement

83% computing

## 1.5

**Industry average**

Global data centre average  
— no requirements

67% computing

33% waste

## 2.0

**Poor**

Half your energy bill is  
overhead — not computing

50% computing

50% waste

**At 150MW: gap between PUE 1.2 and 1.5 = 37MW wasted = enough for 32,000 Nova Scotia homes**



# GREEN CHOICE PURCHASE POWER AGREEMENTS (PPA)

## WITHOUT A PPA

- Data centre connects to the shared grid
- Draws from whatever mix is available
- Could be primarily fossil fuels
- No new renewable generation is created

**DOES YOUR AI RUN ON COAL?**



## WITH GREEN CHOICE PPA

- Data centre signs long-term contract with utility
- Utility builds NEW wind specifically for this load
- That wind farm would not exist without the contract
- Zero draw from existing ratepayers' grid supply

**100% ADDITIONAL CLEAN POWER**

266MW of new wind (Eigg Mountain + Sugar Maple) – built because Green Choice customers signed PPAs

## CASE STUDY – IRELAND

INITIALLY FIRST COME FIRST SERVE

# 22%

of Ireland's national electricity consumed by data centres in 2024

- Grid capacity for new housing blocked in Dublin
- AWS acquired 105 diesel backup generators (674 MW); Microsoft built 239 MW of on-site gas
- Irish households absorbed ~€100 each in 2024 from grid upgrades

*“Data centres accounted for 85% of all Irish electricity demand growth from 2015 to 2023. A single west Dublin facility now consumes electricity equivalent to 200,000 homes.”*

### THE LESSON

**First-come-first-served grid access with no additionality requirement created a crisis. Fixing it took 6 years of political pain. Atlantic Canada still has time to avoid it.**



Scan for CRU policy docu

# CASE STUDY – AMSTERDAM / NETHERLANDS

## FROM MORATORIUM TO TOTAL BAN

**Open market to permanent ban. Six years. The most complete model in the world.**



### 2019: Immediate halt

- Immediate ban. No exceptions, no grandfather clauses.
- Grid at capacity until 2030
- Housing and servers competing for the same land

### 2020–24: Standards

- PUE <1.2 required (Europe's strictest)
- Waste heat must connect to buildings
- National hyperscale ban: Jan 2024

### 2025: Total ban

- No new data centres. Period.
- Science Park now heats 1,300 apartments
- Land prices: €400/m<sup>2</sup> → €1,700/m<sup>2</sup>



## CASE STUDY – VIRGINIA

## WHAT HAPPENS WHEN GROWTH OUTPACES PLANNING

# \$444

per household per year projected  
by 2040 if growth is unchecked

- Loudoun County: world's largest data centre cluster – 4,900 MW and 199 facilities
- Dominion Energy rate hike approved Nov 2025: ~\$13.60/month (~9%) for residential customers
- 25 data centre projects cancelled in 2025 as community opposition turned bipartisan

*Data centres generated \$895 million in tax revenue to Loudoun County in 2025. But unconstrained growth could add \$444 per year to residential electricity bills by 2040.*

### THE LESSON

**Tax revenue does not protect ratepayers. Virginia had to legislate cost separation between data centres and homes – after the backlash. Do it before.**

# CASE STUDY – SINGAPORE | THE MODEL THAT WORKED

**Three-year moratorium. Competitive permitting. Strict conditions. The most disciplined data centre framework in the world.**



## What Singapore did

- 2019: Halted all new data centre development.
- 2022: Lifted moratorium selected 4 operators selected for ~80 MW
- Required PUE  $\leq 1.3$ , Green Mark Platinum, and decarbonisation plans as preconditions

## What they required

- Power Usage Effectiveness  $\leq 1.25$  (industry average:  $\sim 1.5$ ).
- Water Usage Efficiency  $\leq 2.0 \text{ m}^3/\text{MWh}$  within 10 years
- Talent development and ecosystem partnerships

## What communities got

- Grid access treated as a public resource, not a free market commodity
- Only the most efficient, cleanest proposals got built
- Atlantic Canada has similar leverage



## CASE STUDY — NEW BRUNSWICK

# \$2B

proposed data centre  
Investment in Lorneville, Saint John



- VoltaGrid/Beacon AI: 380MW campus.  
190MW on-site gas + NB Power
- NB has "a dense network of unused fibre-optic cable" — The Logic, April 2026
- 100+ residents challenged proponents on water, noise, air, and local hiring
- 210 permanent jobs promised. No community benefit agreement finalized.

*A lot of tough questions. Residents wanted to know about water from Spruce Lake, noise, air emissions, and jobs. The answers are still not clear.*

### THE LESSON

**Lorneville is happening now, next door. Communities in the room early get better outcomes. The concrete isn't poured yet.**

## WHAT ABOUT THE AIR? – NO<sub>x</sub> AND DATA CENTRE GENERATORS

Virginia has 9,000 permitted diesel backup generators at data centres.

**200–600×**

more NO<sub>x</sub> per unit of power  
than a natural gas plant  
(diesel combustion)

### **TODAY – 7% OF PERMITTED EMISSIONS**

Researchers estimate millions of dollars in health costs

### **AT FULL PERMITTED CAPACITY**

9,000 generators. NO<sub>x</sub> equal to half of all Northern Virginia's annual NO<sub>x</sub> from all sources.

### **The simultaneous spike**

During a grid outage, every generator fires at once. Not a steady drip: a burst across one community, on one day

### **The permit gap is growing**

Each new data centre adds more permitted generator capacity. No cumulative air quality review of all approved permits in US or Canada.

### **Lorneville is different**




NB's proposed 190MW plant has on-site gas generation running as primary power. Does Atlantic Canada have an air shed framework for this?

## HOW THE MARITIMES CAN GET AHEAD OF THIS

# The window to shape this is now.

The provinces that align new generation with new load before the requests pile up protect ratepayers and capture the benefit.

### THE PLANNING GAP TO CLOSE

-  Data centre permit **1-2 yrs**
-  Grid connection **3-5 yrs**
-  New transmission **7-10 yrs**

*“The proposed 40GW offshore wind farm in Nova Scotia is a potential generation source that could support a data centre industry in all of Atlantic Canada.”*

**The Maritimes don't need to follow Virginia's mistakes.  
Plan the generation first.**

*TD Economics, 2025*



School of  
Clean Energy



## HOW MARITIME COMMUNITIES CAN GET READY

**Communities that plan proactively get the jobs, the grid investment, and the clean energy – on their terms.**

**01**

**Use the Green Choice Program and require additional clean energy generation**

NS, NB, and PEI all have mechanisms to connect data centres to new renewable generation. Require that new load is matched by new clean supply – not drawn from existing ratepayers' grid allocation.

**02**

**Build the workforce pipeline before the shovels go in.**

Data centre operations, grid management, and energy systems technicians take years to train. Atlantic provinces need to start credential pathways now. Colleges and polytechnics are the lever here.

**03**

**Negotiate community benefit agreements with enforceable teeth.**

Local hiring quotas, grid infrastructure contributions, water impact mitigation, and Indigenous consultation – written into approvals, not press releases. PEI's small-grid experience shows this can be done.



# YOUR COMMUNITY CHECKLIST — BEFORE YOU SAY YES

## Ten questions every Maritime community should ask before a data centre proposal is approved.

- 01 Is the power coming from NEW renewables — or drawing down existing clean supply?
- 02 Who pays for grid upgrades, substation work, and transmission — the developer or ratepayers?
- 03 What is the binding local hiring commitment, in permanent jobs, with a number?
- 04 Is there an independent water impact assessment before approval?
- 05 Does the community benefit agreement have a security deposit and clawback clause?
- 06 Have Mi'kmaw / First Nations Nations communities been meaningfully consulted?
- 07 What is the Power Usage Effectiveness target — and who verifies it?
- 08 What happens to the facility and the land when the lease expires?
- 09 Does the developer fund local workforce training and apprenticeships?
- 10 What independent oversight body monitors compliance after construction?

GET THE FULL CHECKLIST



[francissyms.com/resources](https://francissyms.com/resources)

Full checklists, additional resources.

# The Maritimes can get this right

We have the wind, the nuclear base, the fibre, the climate, and the talent.

**Plan the generation before approving the load**

**Negotiate community benefit agreements early**

**Build the workforce pipeline today**

# THANK YOU!

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[humber.ca/schoolofcleanenergy](https://humber.ca/schoolofcleanenergy)

