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# PORTLAND REPLACEMENT OF FOSSIL FUELS ALTERNATIVE FUND

SEPTEMBER 2024

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# ROADMAP

- Population and economic growth are driving an increase in global demand for energy.
- The current energy system is largely dependent on fossil fuels, which negatively impact air quality, and significantly contribute to carbon emissions.
- To meet this growing demand, a transformation is required in the way the world produces, delivers and consumes energy.
- Unlike renewable energy sources, nuclear energy can provide constant, reliable, and carbon-free power.
- The innovative technology of small modular reactors have the potential to solve historic nuclear energy challenges, offering the opportunity for a clean and nuclear powered tomorrow.
- Emerging market economies account for 90% of the anticipated growth of global energy demand.
- Hydrogen produced by nuclear energy in established markets could be a reliable supply of clean energy for these developing nations.
- Companies involved in the operation, development and innovation of the nuclear and alternative energy sectors could benefit and attract investor interest.
- Portland Investment Counsel Inc. (“Portland” or the “Manager”) is leveraging their private investment experience and industry network in their investment decision making process.
- Portland Replacement of Fossil Fuels Alternative Fund is a liquid and focused fund with the goal to invest in companies that work towards energy transition, with a current focus on nuclear energy.
- *Prosperitate cum Caritate* = Doing Well, by Doing Good.

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# THE CHALLENGE

# THE GLOBAL DEMAND FOR ENERGY

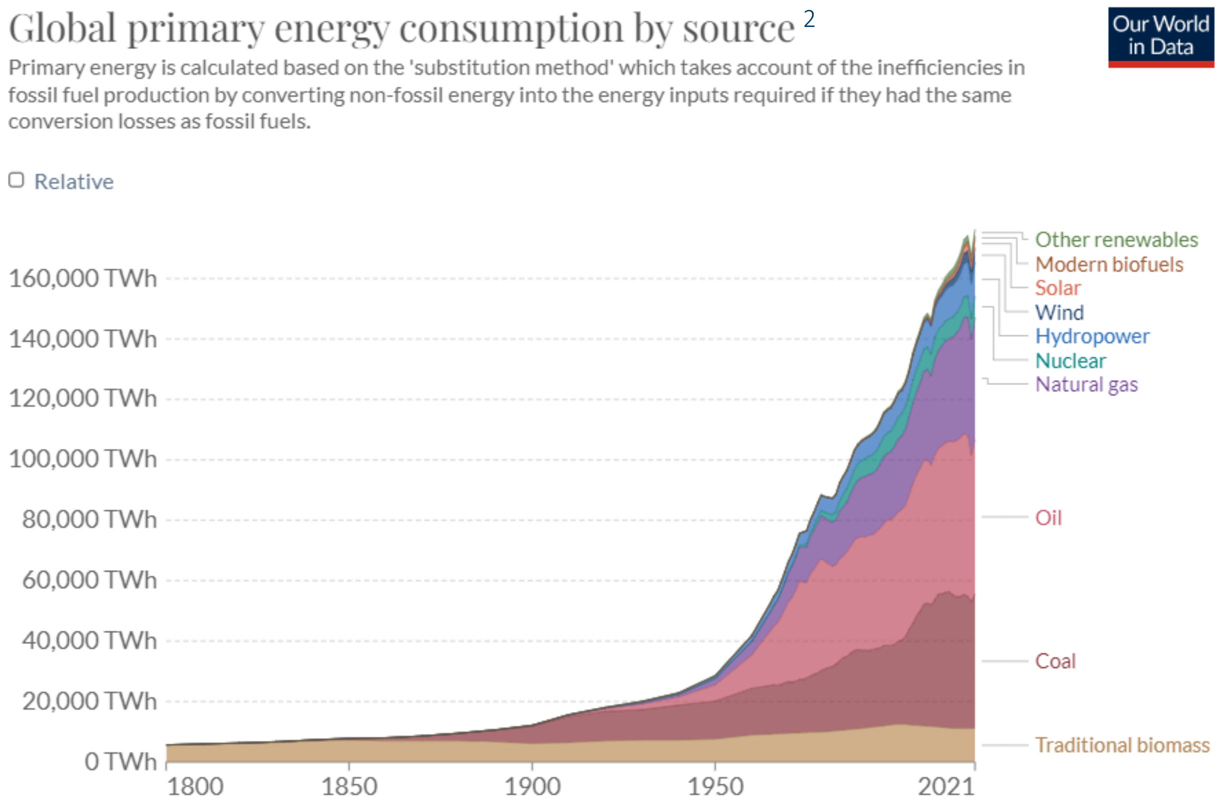
- Energy plays a fundamental role in the economic development of nations worldwide.

**Historically, 1% growth in GDP has required 1.2% growth in energy consumption.**

- In the 20th century the world population grew 4 times, economic output 22 times and fossil fuel consumption 14 times[1].
- U.S. Energy Information Administration projects ~50% growth in global energy consumption between 2018 and 2050.
- Geopolitical risks and events bring rise to energy security concerns, risks become more prominent as more consumers require ever more energy resources.

## Global primary energy consumption by source [2]

Primary energy is calculated based on the 'substitution method' which takes account of the inefficiencies in fossil fuel production by converting non-fossil energy into the energy inputs required if they had the same conversion losses as fossil fuels.

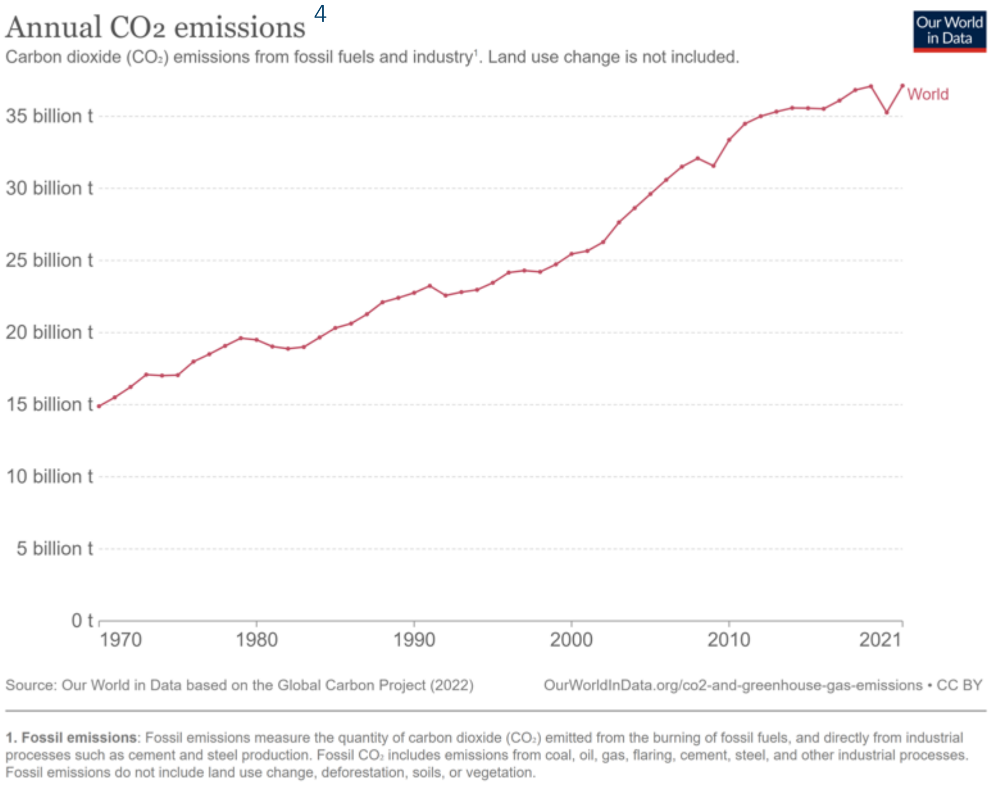


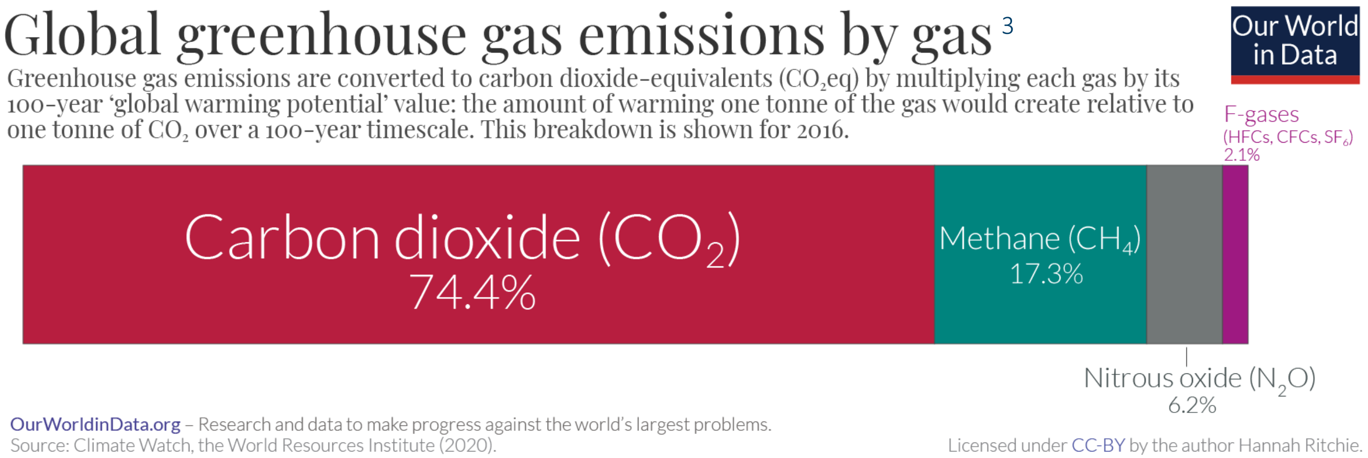

Source: Our World in Data based on Vaclav Smil (2017) and BP Statistical Review of World Energy

OurWorldInData.org/energy • CC BY

# CLIMATE CHANGE AND GREENHOUSE GASES

- Rising greenhouse gas (GHG) emissions are among the top climate change concerns.
- The main share of GHG emissions is represented by carbon dioxide, methane and nitrous oxide.
- **Methane** emissions are mostly contributed by the agriculture industry.
- **Nitrous oxide** emissions have increased due to nitrogen fertilizers used in agriculture.
- **Carbon dioxide** makes up the largest share of GHGs. They are the result of burning fossil fuels (oil, coal and natural gas) in the production of energy.

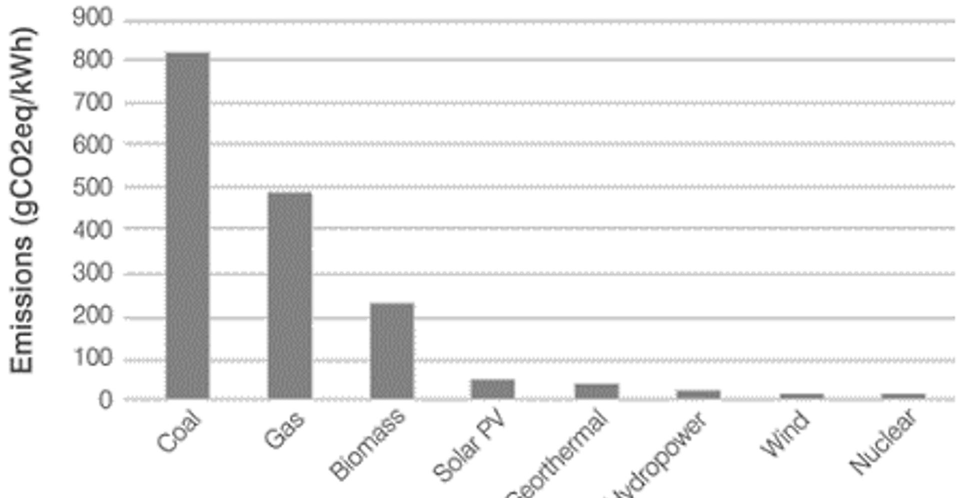


# CARBON DIOXIDE

- 73% of greenhouse gases are emitted by the energy sector.
- Fossil fuels (coal, oil, natural gas) have historically satisfied the energy demand but they are the largest emitters of carbon dioxide.
- Recent data shows carbon dioxide emissions reaching an all time high in 2022.
- **Climate change is primarily an energy problem.**

**Life-cycle carbon emissions from selected electricity supply technologies**




Source: World Nuclear Association
https://world-nuclear.org/

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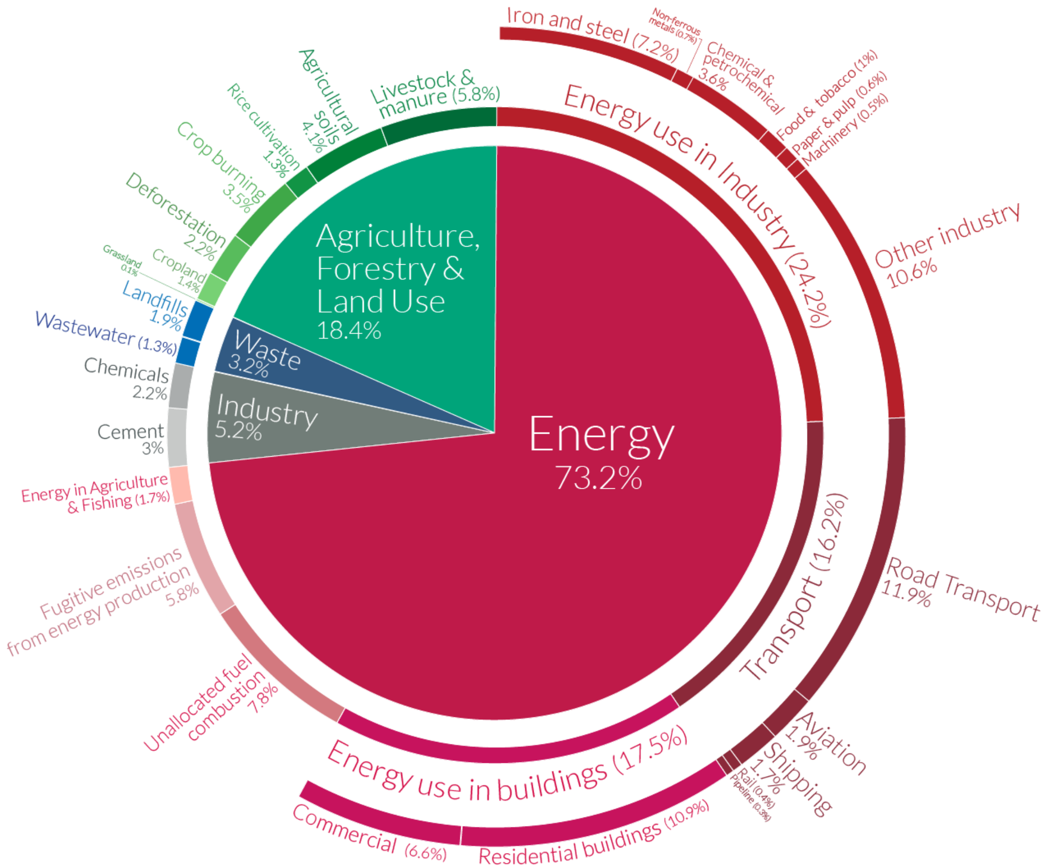
## Global greenhouse gas emissions by sector [5]

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes $CO_2$eq.




OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020).

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# POTENTIAL SOLUTIONS

# REPLACEMENT OF FOSSIL FUELS

## What are non-fossil energy sources?

**Renewables**

Sources that do not deplete over time, and regenerative

- Solar, wind, hydro and geothermal

**Green**

Energy sources that have the least environmental impact

- Solar, wind, existing hydro, geothermal and nuclear

**Clean**

Energy sources that do not emit GHGs or pollutions during generation

- Solar, wind, hydro, geothermal and nuclear

**Alternative Fuels**

(Enabled by Nuclear) fuels like gas/diesel made with minimal emissions

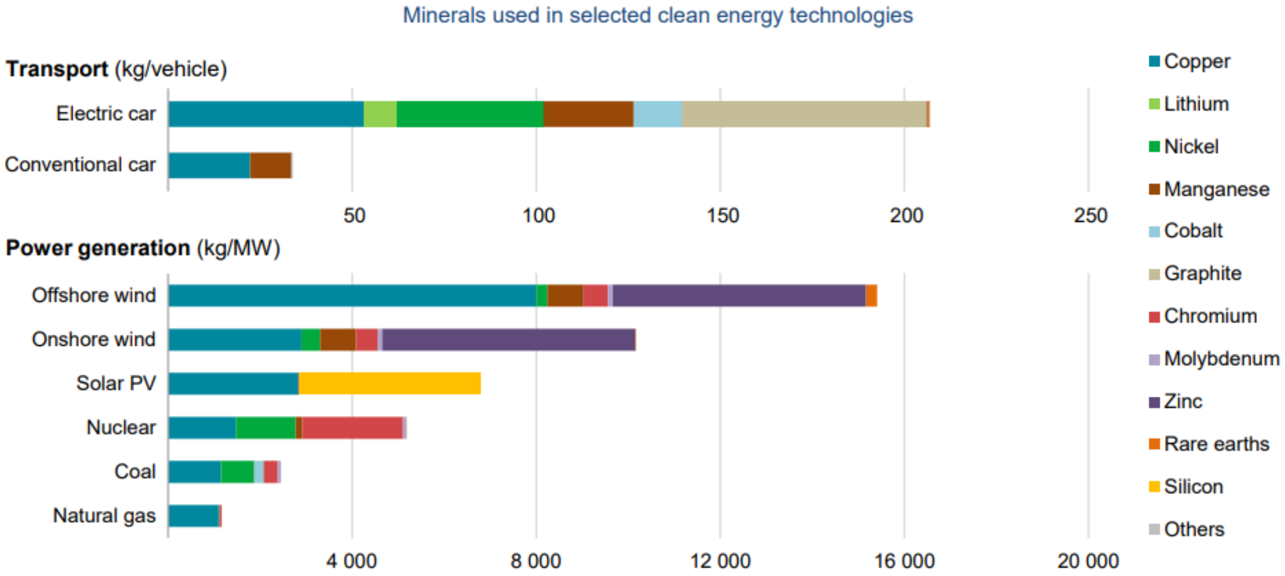
- Hydrogen

# RENEWABLES HAVE LIMITATIONS

Renewable energy sources have gained popularity due to their perceived environmental benefits and potential to reduce dependence on non-renewable energy sources.

However, they have limitations:

- Intermittency
- Limited energy efficiency
- Energy storage
- Land use
- Infrastructure limitations
- Resource requirements




Minerals used in clean energy technologies compared to other power generation sources IEA, Paris[6]

| Technology | Capacity* | Median Square Meters per MegaWatt (MW)[7] |
|---|---|---|
| Wind | 35.4% | 99 $m^2$ |
| Solar | 24.9% | 19 $m^2$ |
| **Nuclear** | **92.5%** | **0.3 $m^2$** |

*Source: U.S. Energy Information Administration (March 2021)

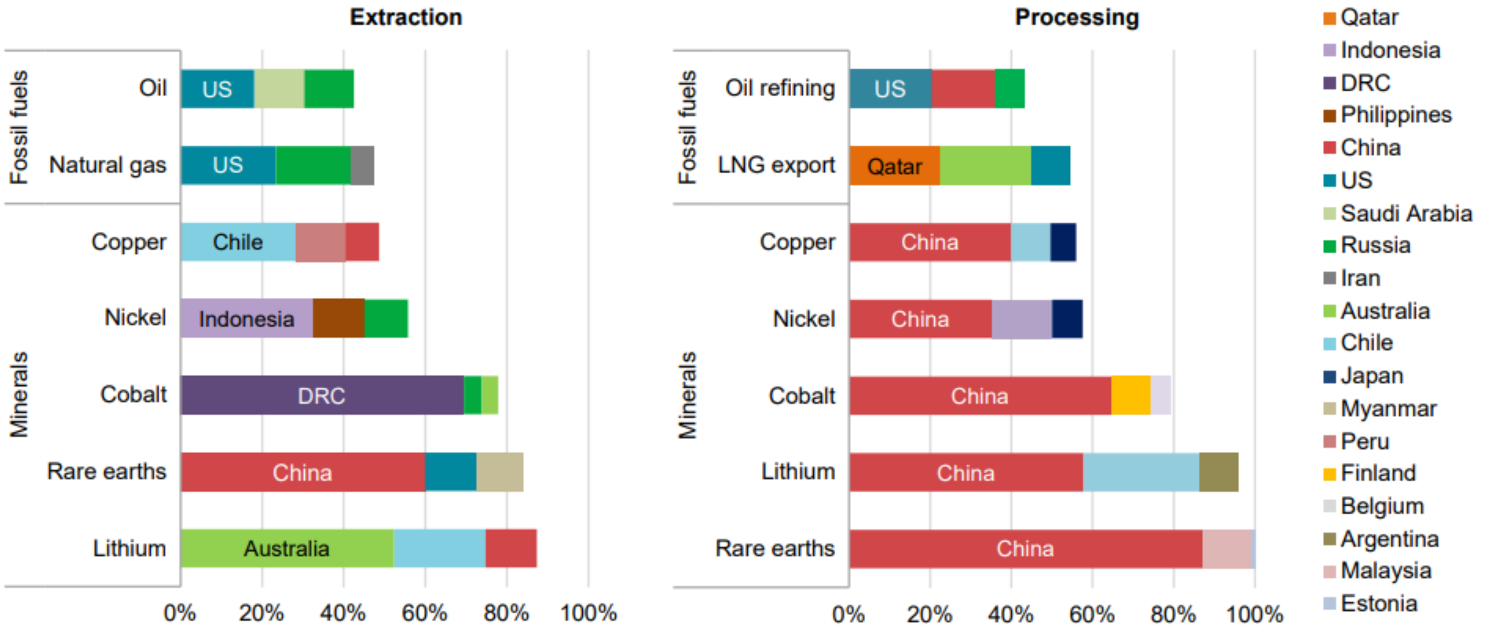
# BATTERIES HAVE LIMITATIONS

Electrification* and renewable energy rely heavily on batteries.

Despite significant technological improvements, batteries still face challenges:

- Energy Density
- Short Lifespans
- Raw Material Availability & Dependency
- Environmental Impact
- Recycling Difficulty

Share of top three producing countries in production of selected minerals and fossil fuels, 2019




Minerals used in clean energy technologies compared to other power generation sources IEA, Paris[6]

*charging with electricity

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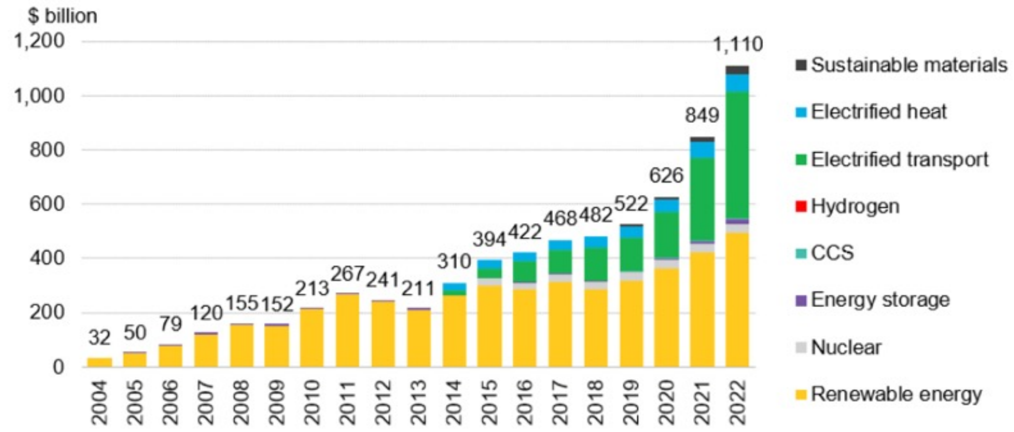
# TIME FOR A NUCLEAR CHANGE

- Previous global investment in the energy transition has been focused on renewable energy and electrification.
- In 2022, industries active in the energy transition drew a record US$1.1 trillion.
- Despite these investments, carbon dioxide emissions continue to increase, we believe there's a need to consider other clean energy solutions such as nuclear.

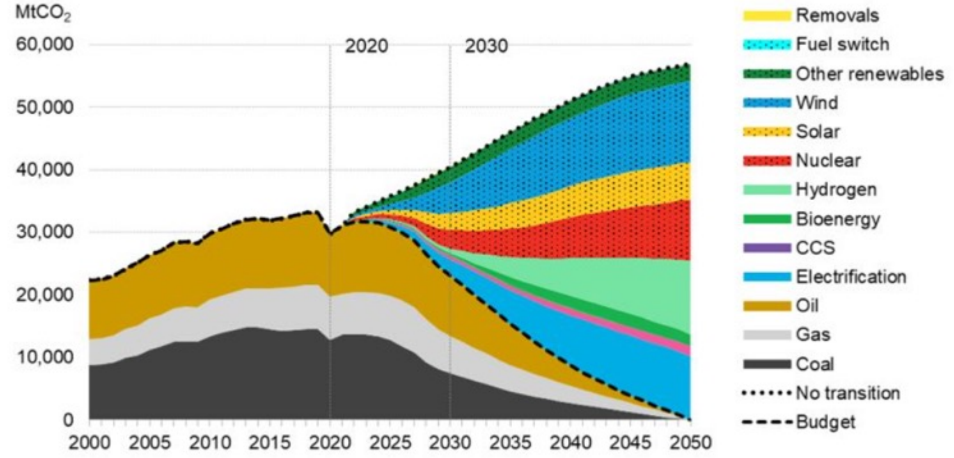
**Global investment in energy transition by sector [8]**




*Source: BloombergNEF*

## Nuclear and hydrogen energy have yet to witness significant investments.

- Nuclear and hydrogen energy sources play an important role
  - Achieving a sustainable energy mix and net-zero future




*Source: BloombergNEF* [9]

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# NUCLEAR ENERGY



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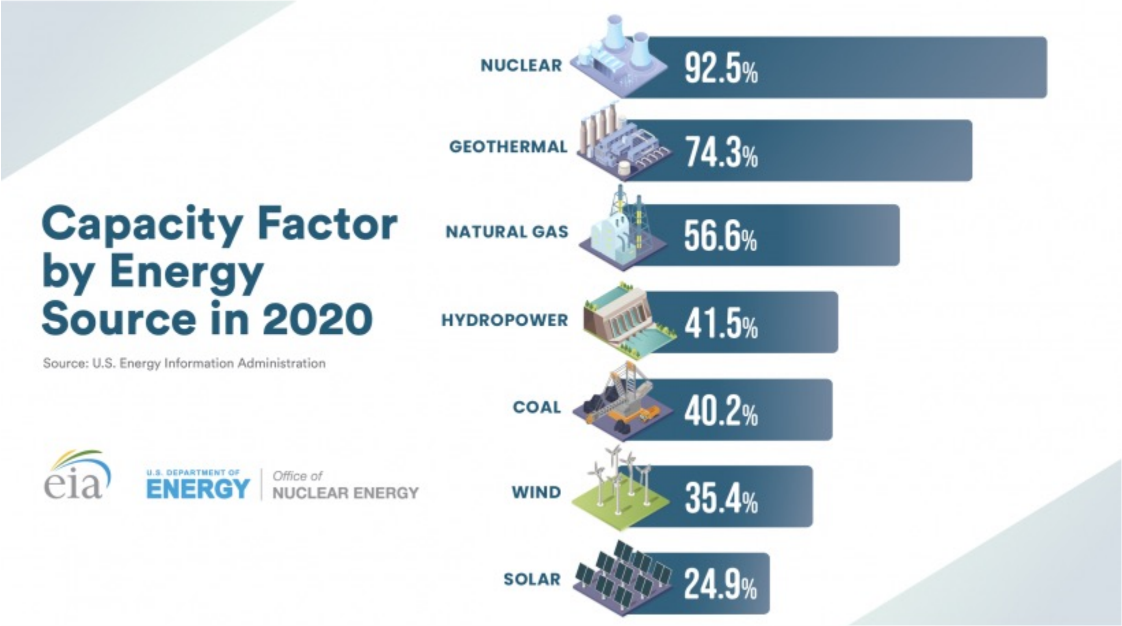
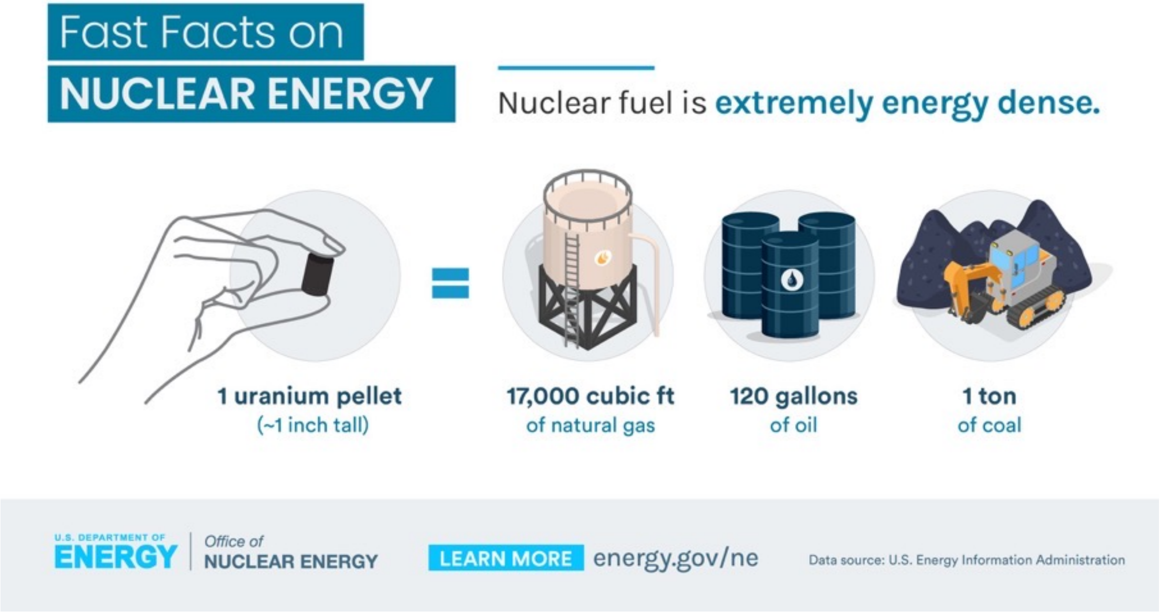
# NUCLEAR TODAY

## Nuclear: High energy capacity




Source: U.S. Energy Information Administration (March 2021)

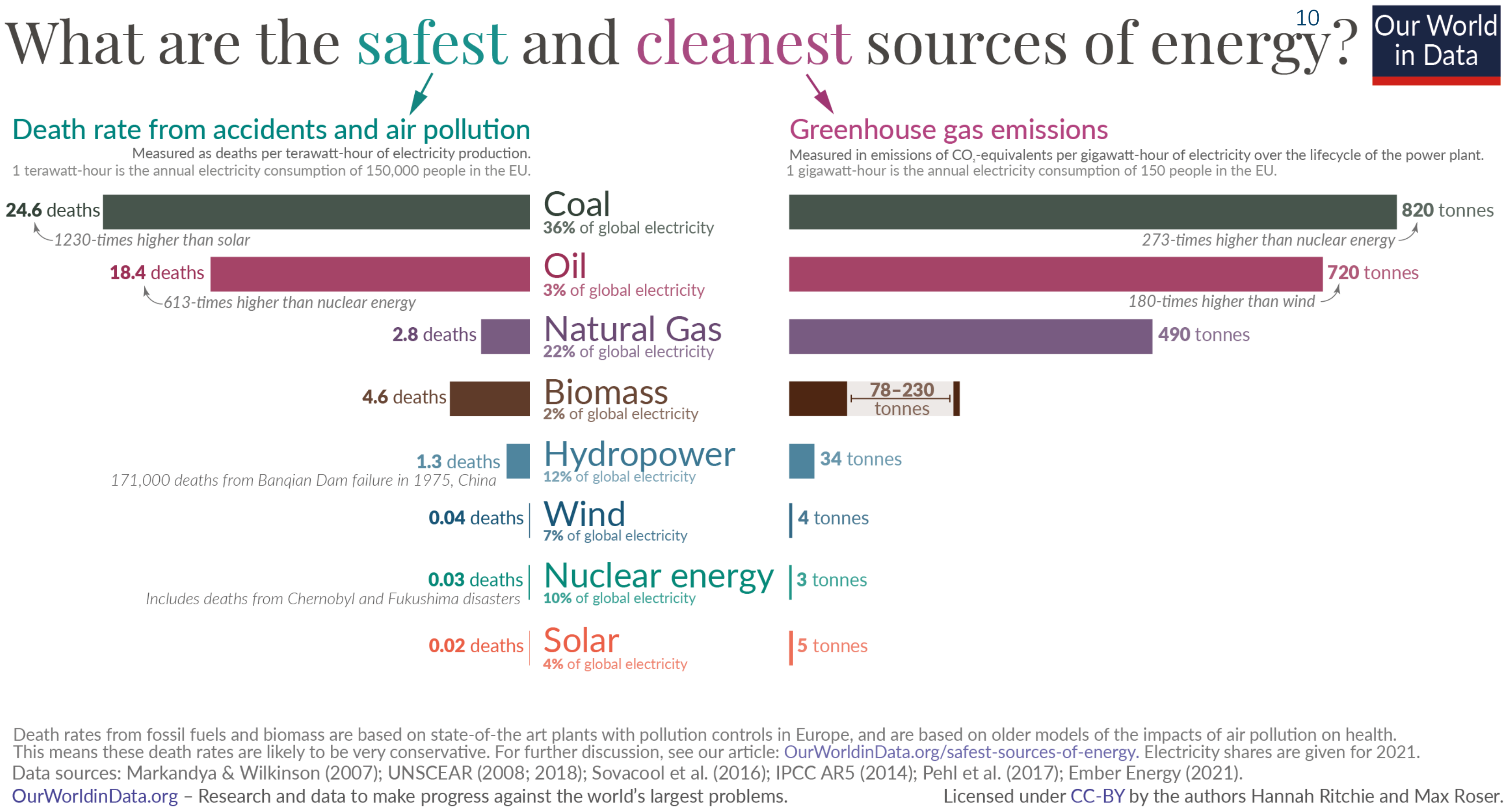
## Nuclear: High energy density




Source: U.S. Department of Energy (July 2022)

Capacity Factor by Energy = Maximum Power Output

# MISCONCEPTIONS OF NUCLEAR




[10]

- Nuclear energy has been subject to many misconceptions due to its association with the risks of nuclear accidents, nuclear weapons and nuclear waste.
- Due to past incidents, we consider the industry as one of the most regulated sectors within the energy sphere that is subject to rigorous regulation at both the international and national levels.
- All energy sources have negative effects, fossil fuels are the dirtiest and most dangerous, while **nuclear is safer and cleaner.**

# THE NEED FOR NUCLEAR ENERGY

- In 2021, 438 operational reactors provided ~10% of the global electricity supply.
- Existing plants are beginning to close, ~25% nuclear capacity are expected to be shut down by 2040.
  **~215 new large scale reactors** would be required to maintain existing nuclear capacity worldwide
- Portland estimates (using International Energy Agency projections):

> **An additional ~ 550 new large-scale reactors, beyond maintaining pre-existing nuclear capacities, are required to contribute to a net zero emissions by 2050.**

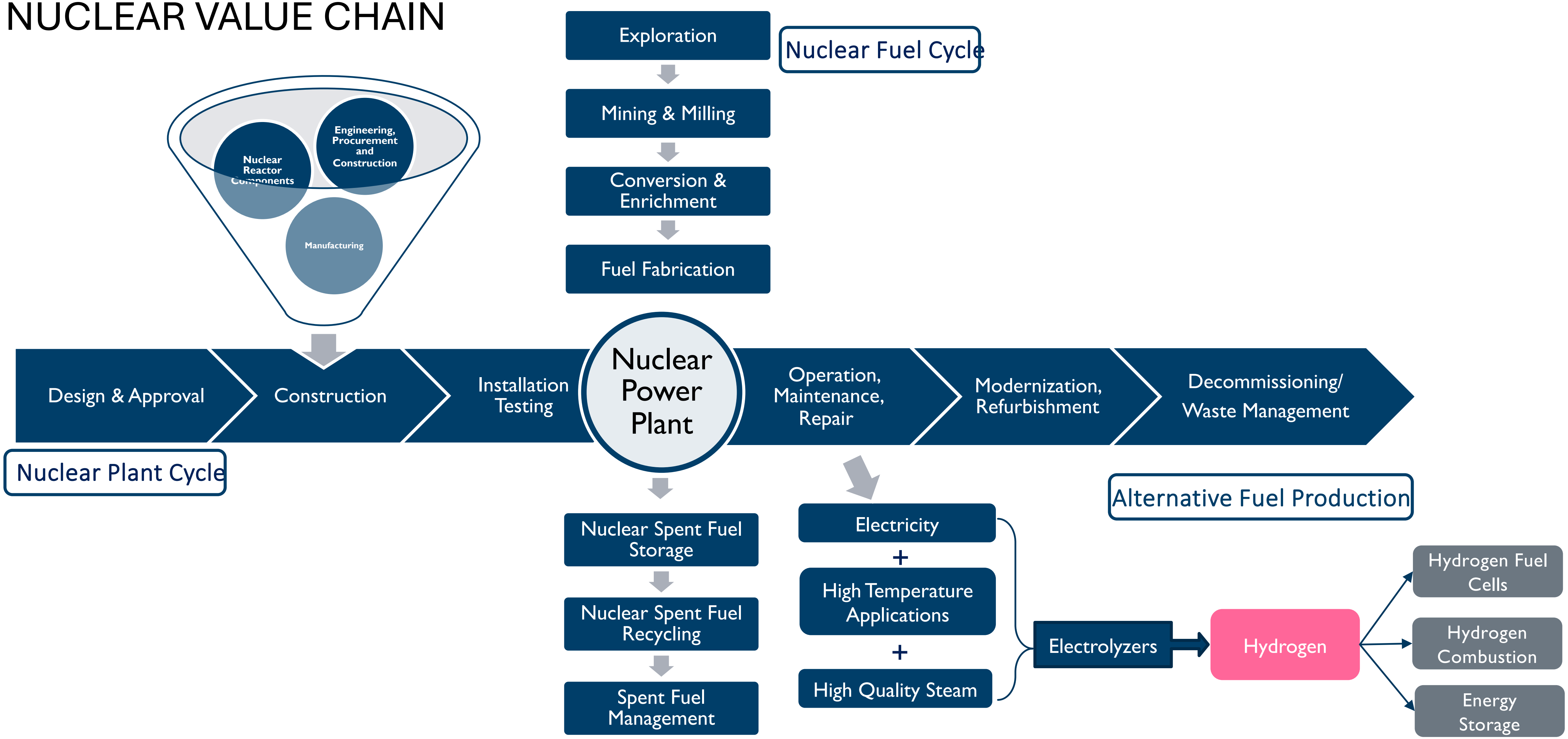
| Country | In Operation | Under Construction | Planned | Proposed |
|---|---|---|---|---|
| China | 55 | 21 | 47 | 156 |
| India | 22 | 8 | 12 | 28 |
| Russia | 37 | 3 | 25 | 21 |
| USA | 92 | 2 | 3 | 18 |
| Canada | 19 | - | - | 2 |
| Japan | 33 | 2 | 1 | 8 |
| Saudi Arabia | - | - | - | 16 |
| South Korea | 25 | 3 | - | 6 |
| Ukraine | 15 | 2 | - | 9 |
| Others | 140 | 17 | 16 | 77 |
| **Total** | **438** | **58** | **104** | **341** |

Source: World Nuclear Association
https://world-nuclear.org/

**An ambitious target, is it feasible?**

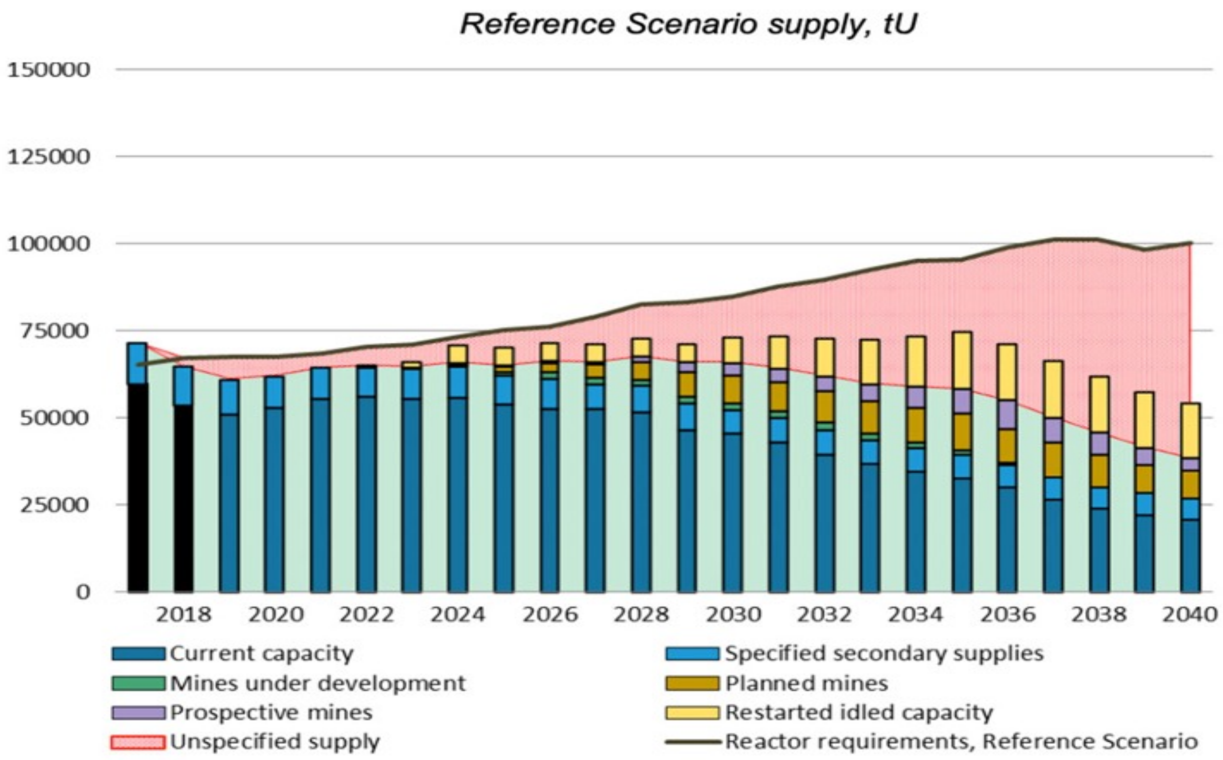
- On average, it can take 10 years to build a new large scale nuclear reactor. Extended timelines could impede the meaningful impact.
- Therefore small modular reactors (SMRs) will play an important role in the nuclear renaissance.

# NUCLEAR VALUE CHAIN



# URANIUM

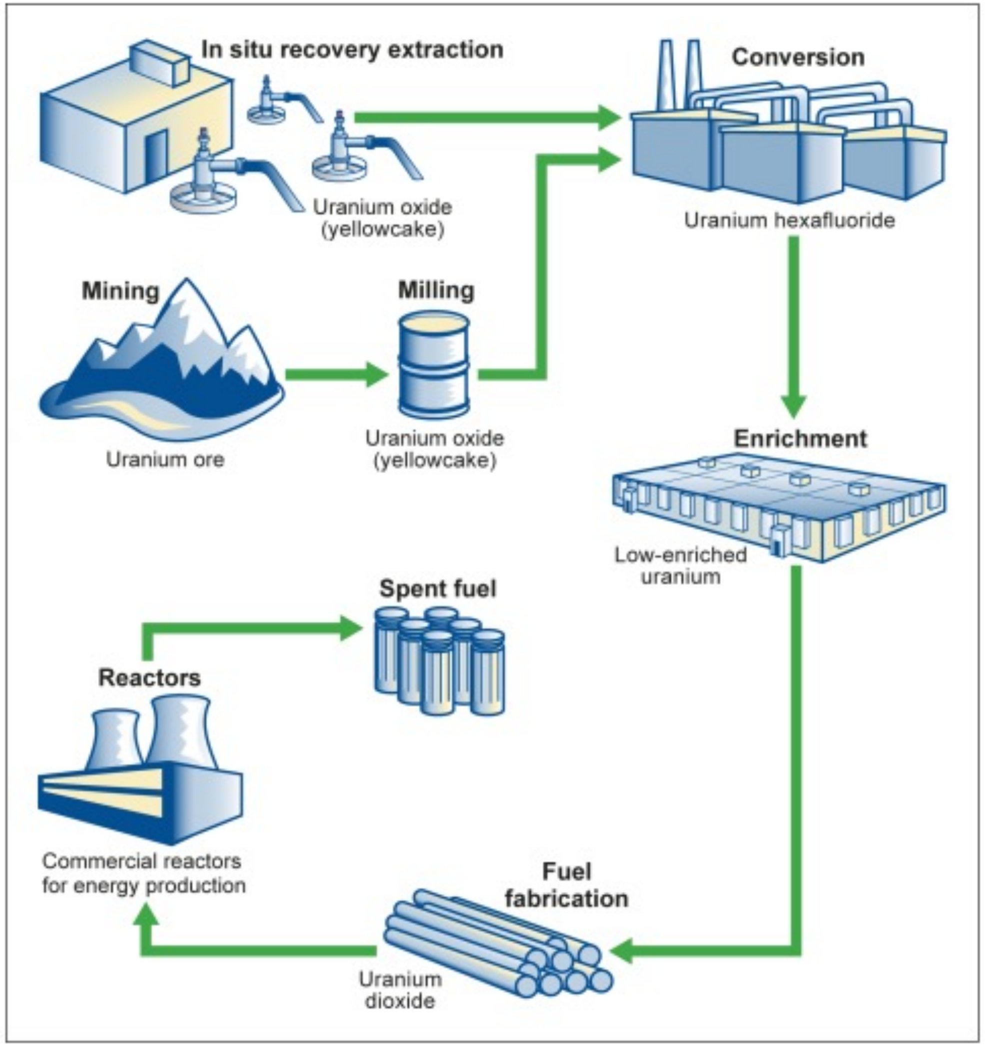
- Uranium is the most widely used fuel to power nuclear reactors.
- The global supply of uranium is sourced from a variety of countries. The largest producers are Kazakhstan, Australia, Namibia, and Canada.
- By 2030, there will not be enough uranium production to meet anticipated demand, even if every single mine and planned project goes into production.
- As SMRs move closer to deployment, enriched uranium demand is likely to see rapid growth through the late 2020s.




Source: World Nuclear Association
https://world-nuclear.org/

# NUCLEAR FUEL CYCLE

- Uranium ore must undergo a series of four processing stages to make nuclear fuel. These steps include **mining and milling, conversion, enrichment, and fuel fabrication.**
- **Mining**: Uranium is a common metal found in an inert state, it is ~500 times more abundant than gold.
- **Milling:** Mined uranium ore is crushed and chemically treated to create a uranium solution. This solution is separated, filtered and dried to produce a uranium oxide concentrate, often referred to as 'yellowcake'.
- **Conversion and Enrichment:** Yellowcake is converted for enrichment. The enrichment process produces a higher concentration of uranium required to run a nuclear fission reaction, powering the reactor.
  - Commercial enrichment facilities are located in France, Germany, the Netherlands, the United Kingdom, the United States, and Russia.
- **Fuel Fabrication:** Enriched uranium pressed to form small fuel pellets. The pellets are inserted into thin tubes known as fuel rods used in nuclear reactors.[11]




Source: U.S. Government Accountability Office, Nuclear Weapons, NNSA Should Clarify Long-Term Uranium Enrichment Mission Needs and Improve Technology Cost Estimates, GAO-18-126, February 2018.

# LARGE SCALE NUCLEAR POWER PLANTS

- A single large scale nuclear reactor typically provides 700-1400 MW of energy
  - The average large scale reactor could power 1.2 million homes

## Benefits

- Cost-effective
- Long lifespan
- Reliable energy source

## Challenges

- Generational gap in expertise
- Challenged Construction Process
- Extensive Supply Chain

**Large Scale Nuclear Power Plants Under Construction**

| Model | Country, Operator | Reactors |
|---|---|---|
| AP1000 | USA, Southern | 1 |
| APR1400 | Korea, KHNP | 3 |
| APR1400 | UAE, ENEC | 1 |
| CAP1000 | China, CNNC | 2 |
| CAP1000 | China, SPIC | 1 |
| CAP1400 | China, SPIC & Huaneng | 2 |
| CFR600 | China, CNNC | 2 |
| EPR | France, EDF | 1 |
| EPR | UK, EDF | 2 |
| FBR | India, NPCIL | 1 |
| Hualong One | China, CGN | 6 |
| Hualong One | China, Guodian & CNNC | 2 |
| Hualong One | China, Huaneng & CNNC | 2 |
| PHWR-700 | India, NPCIL | 3 |
| Pre-Konvoi | Brazil, Eletrobrás | 1 |
| VVER-1000 | India, NPCIL | 4 |
| VVER-1000 | Iran | 1 |
| VVER-1200 | Bangladesh | 2 |
| VVER-1200 | Belarus, BNPP | 1 |
| VVER-1200 | China, CNNC | 2 |
| VVER-1200 | China, CNNC & Datang | 2 |
| VVER-1200 | Egypt, NPPA | 2 |
| VVER-1200 | Turkey | 4 |
| VVER-TOI | Russia, Rosenergoatom | 2 |

Data Sourced From: World Nuclear Association
https://world-nuclear.org/

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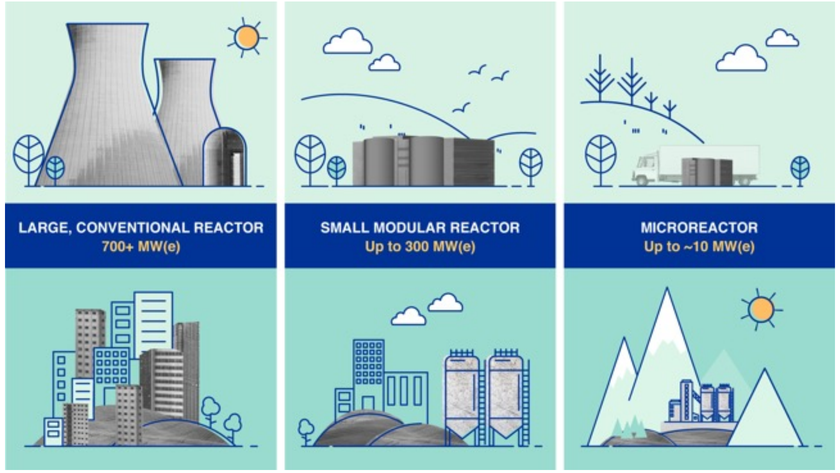
# SMRs: AN INTRODUCTION

- SMRs are advanced nuclear reactors.
- Designed to be built at a smaller size but in larger numbers.
- Range in power output from micro (5-10 MW) to small (300 MW).




Source: International Atomic Energy Agency

- Over 80 SMR designs under development in 19 countries.
- Conservative estimates place a potential annual SMR market between 2025 and 2040:
  - > $5 billion in Canada
  - > $150 billion globally

**SMRs are designed to be:**

- **Small** - fraction of the size of conventional nuclear power reactors.
- **Modular** - factory-assembled and transported as a unit for installation.
- **Reactor** – harness nuclear fission to produce electricity, heat and high quality steam.[12]

A Rolls Royce reactor module, one of the many SMR designs currently being developed, on a truck. Many such modular reactors are designed to be small enough to transport by truck or shipping container.

Source: International Atomic Energy Agency

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# SMRs: LEADING DESIGNS

- **GE-Hitachi's BWRX 300**
  - Ontario Power Generation, GE Hitachi Nuclear Energy, SNC-Lavalin, and Aecon are collaborating to construct North America's first SMR at the Darlington New Nuclear Project site.
  - The companies will partake in an integrated project delivery model, where the completion date is anticipated in late 2028.
  - The project will aid Canada's ambition to become a global SMR technology hub in an annual market estimated to be over CA$150 billion by 2040.
- **X-energy's Xe-100**
  - The Xe-100 is one of two designs that secured >US$2.5 billion in funding via the Bipartisan Infrastructure Law.
  - X-energy entered a joint agreement with Dow Inc. to install the Xe-100 reactor at a Dow Gulf Coast site for low-carbon power and steam within this decade.
- **TerraPower's Natrium SMR**
  - The Natrium Reactor is the second of two designs to secure > US $2.5 billion in funding.
  - This is a joint project with Rocky Mountain Power, a division of PacifiCorp, to deploy the first 345MWe (with the ability to produce 500MWe for short periods using thermal energy storage) in Wyoming.
- **NuScale's VOYGR™ SMR**
  - The VOYGR™ SMR was the first SMR approved by the U.S. Nuclear Regulatory Commission for operational use in the United States, with the first expected to be operational in the U.S, by 2029.
  - NuScale Power has 19 signed and active domestic and international agreements to deploy SMR plants in 12 different countries, including Poland, Romania, the Czech Republic, and Jordan in addition to the Carbon Free Power Project.[13]

Small reactors for near- future deployment

| Name | Capacity | Type | Developer |
|---|---|---|---|
| VBER-300 | 300 MWe | PWR | OKBM, Russia |
| NuScale Power Module | 77 MWe | Integral PWR | NuScale Power + Fluor, USA |
| SMR-160 | 160 MWe | PWR | Holtec, USA + SNC-Lavalin, Canada |
| ACP100/Linglong One | 125 MWe | Integral PWR | NPIC/CNPE/CNNC, China |
| SMART | 100 MWe | Integral PWR | KAERI, South Korea |
| BWRX-300 | 300 MWe | BWR | GE Hitachi, USA |
| ARC-100 | 100 MWe | Sodium FNR | ARC with GE Hitachi, USA |
| Integral MSR | 192 MWe | MSR | Terrestrial Energy, Canada |
| BREST | 300 MWe | Lead FNR | RDIPE, Russia |
| RITM-200M | 50 MWe | Integral PWR | OKBM, Russia |
| Xe-100 | 80 MWe | HTR | X-energy, USA |
| Natrium | 345 MWe | Sodium FNR | TerraPower, USA |

Data Sourced From: World Nuclear Association
https://world-nuclear.org/

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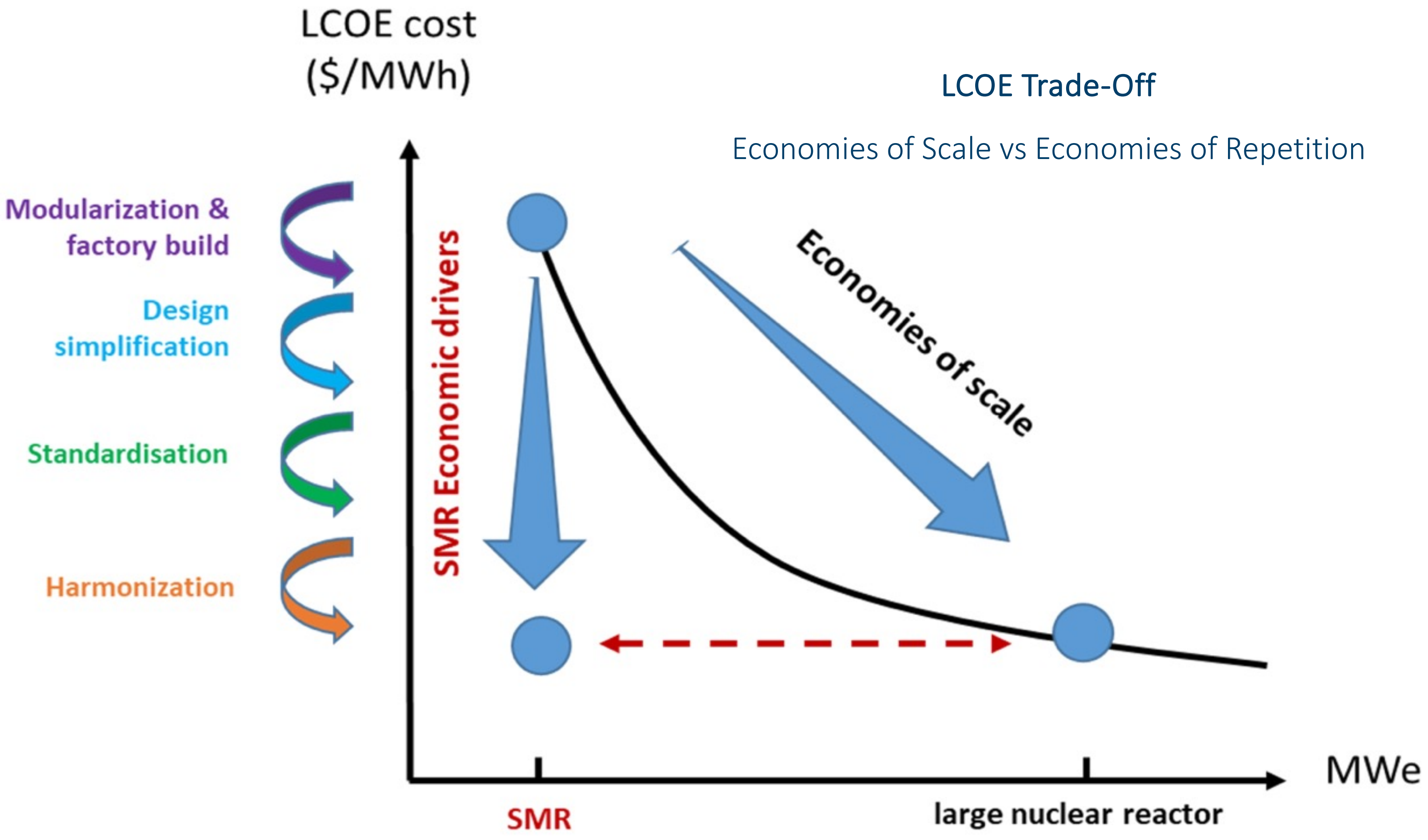
# SMRs: ACHIEVING ECONOMIES OF REPETITION

Deployment of advanced SMRs is expected to happen in large numbers, affording economies of repetition, leading to increased efficiency and lower levelized cost of energy (LCOE).

Lower initial capital investment, greater scalability, and siting flexibility are advantageous features SMRs can offer in comparison to conventional large reactors.

**LCOE Trade-Off**

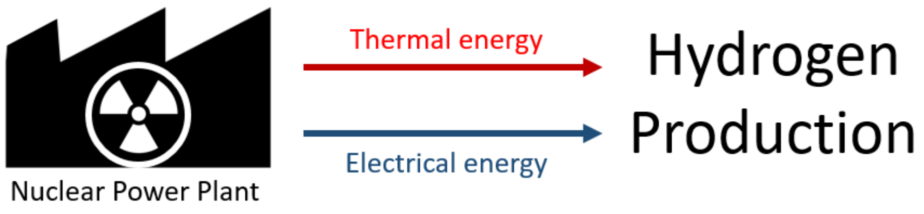
Economies of Scale vs Economies of Repetition




Cited from; NEA (2021), SMR key economic drivers to compensate for diseconomies of scale, OECD Publishing, Paris

# NUCLEAR ENERGY CAN PRODUCE HYDROGEN

- Hydrogen production requires water and significant amounts of electrical energy input.
- Nuclear power plants generate electricity, heat and high quality steam.
- Nuclear power can be used to produce hydrogen through electrolysis using fuel cells, able to achieve higher levels of efficiency.
- Steam inherently possesses higher energy levels, further reducing the energy inputted required to produce hydrogen when electrolyzing steam rather than water.
- A 1000 MW nuclear reactor can produce up to 150,000 tonnes of hydrogen annually.




**90%**
Projected long term efficiency of nuclear powered electrolyzers

VS

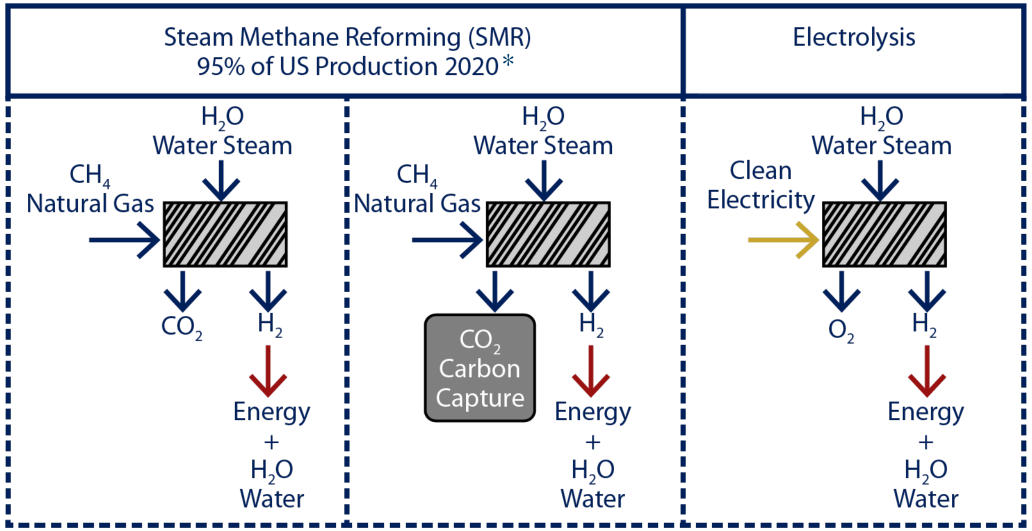
**74%**
Projected long term efficiency of current electrolyzers

# ABOUT HYDROGEN

- Hydrogen is an energy carrier, playing an important role in a decarbonized future
  - 26 governments have committed to adopt hydrogen within their future energy system.

- Pure forms of hydrogen can be achieved from steam methane refining or electrolysis;
  - **Steam Methane Reforming:** Hydrogen is separated from hydrocarbons, where carbon dioxide and carbon monoxide is released in the process.
  - **Electrolysis:** Hydrogen is separated from oxygen atoms in water, or hydrogen is separated from nitrogen atoms in ammonia.

- Hydrogen energy can be produced from two different forms;
  - **Hydrogen fuel cell:** Electricity is generated when combining hydrogen and oxygen atoms. Hydrogen reacts with oxygen producing electricity, water, and small amounts of heat.
  - **Hydrogen combustion:** The hydrogen engine would mimic a traditional internal combustion engine as a clean alternative burning hydrogen, where the only byproduct is water.




* US Department of Energy

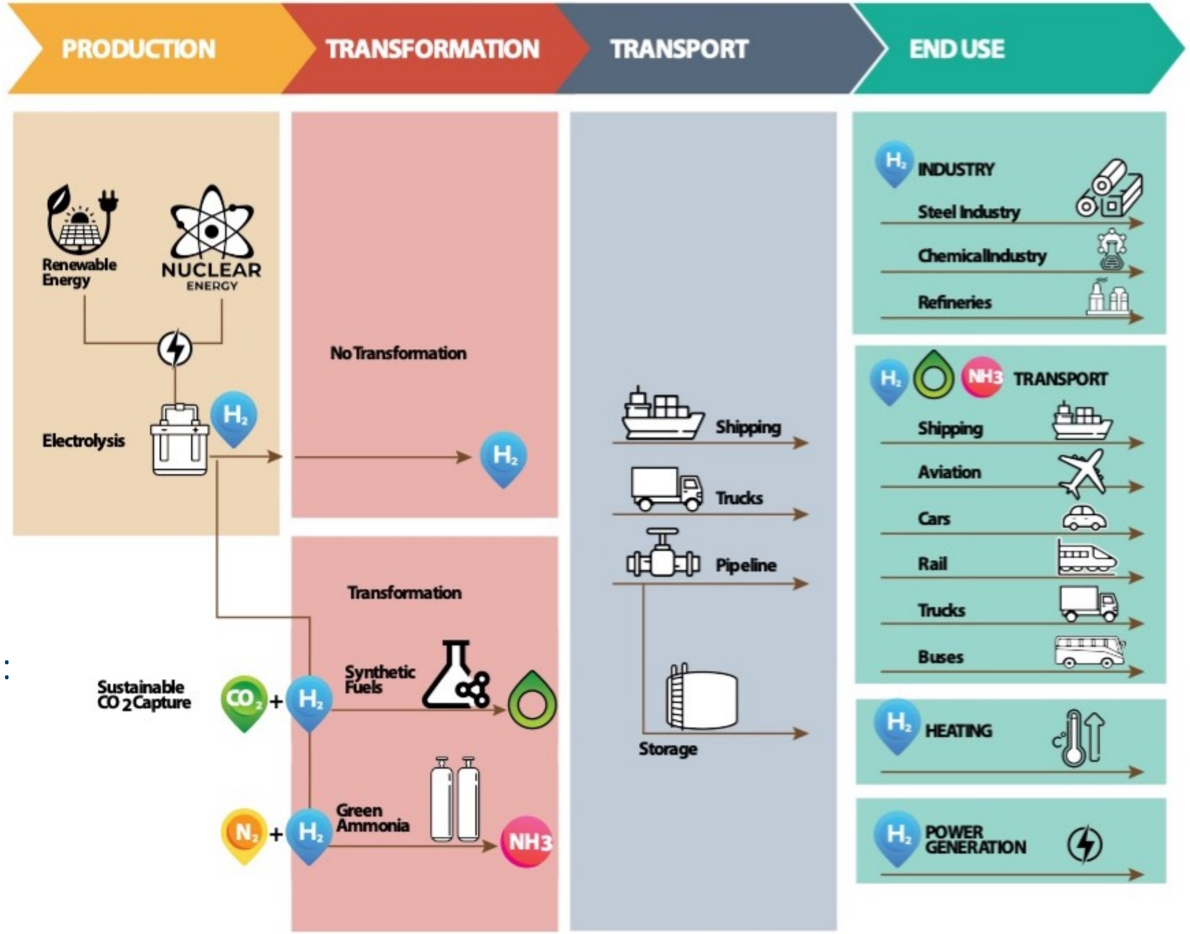
# USES OF HYDROGEN ENERGY

- Hydrogen energy has multiple end uses across various sectors:
  - Industry Feedstock
  - Transport
  - Heating
  - Power Generation
  - Energy storage

The IEA projects hydrogen demand would double by 2030.

Approximately half of this demand would come from new applications:

Heavy industry, power generation and the production of hydrogen-based fuels

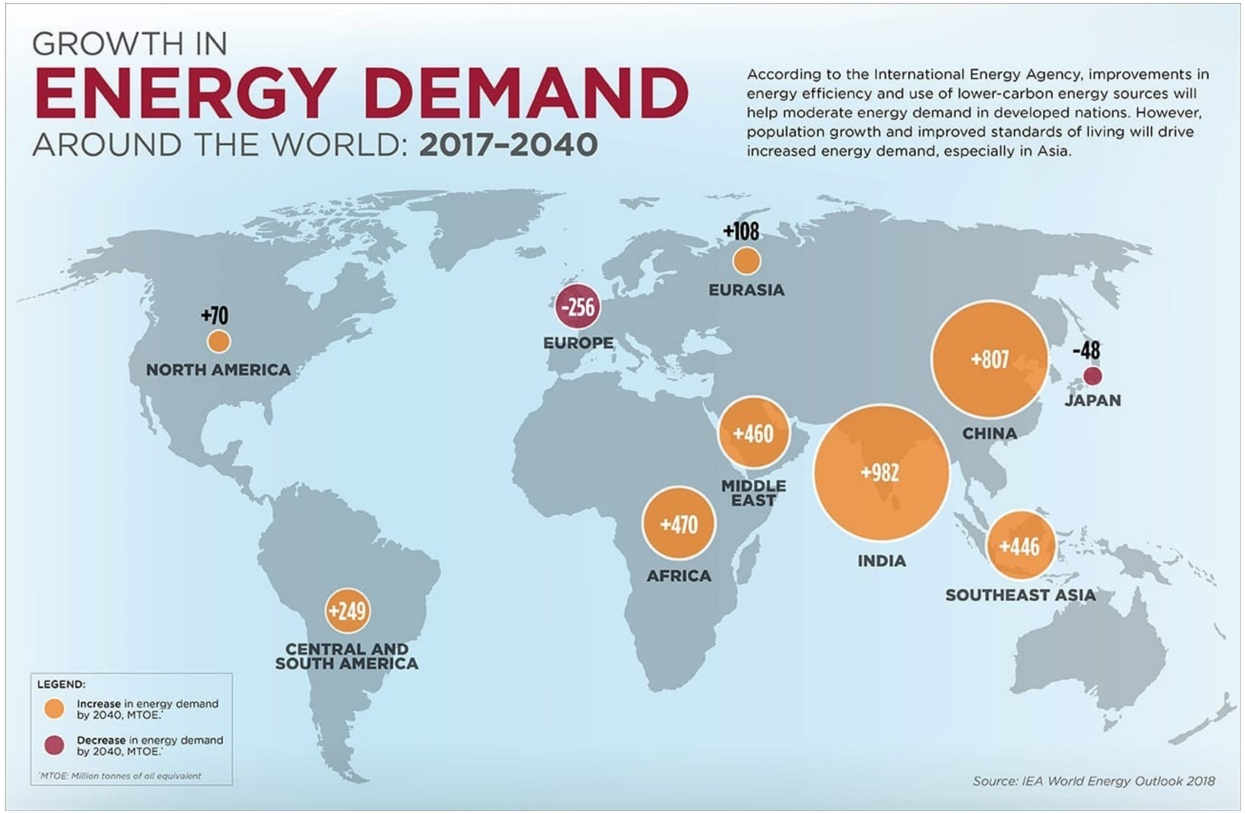


# HYDROGEN: A SOLUTION FOR DEVELOPING NATIONS

- Emerging market economies account for 90% of energy demand growth to 2035. [14]
- The greatest increase in energy demand projected by the IEA is anticipated in Africa, Southeast Asia, the Middle East, China and India.
- These potential regions may face certain restrictions in building their own nuclear fleet.

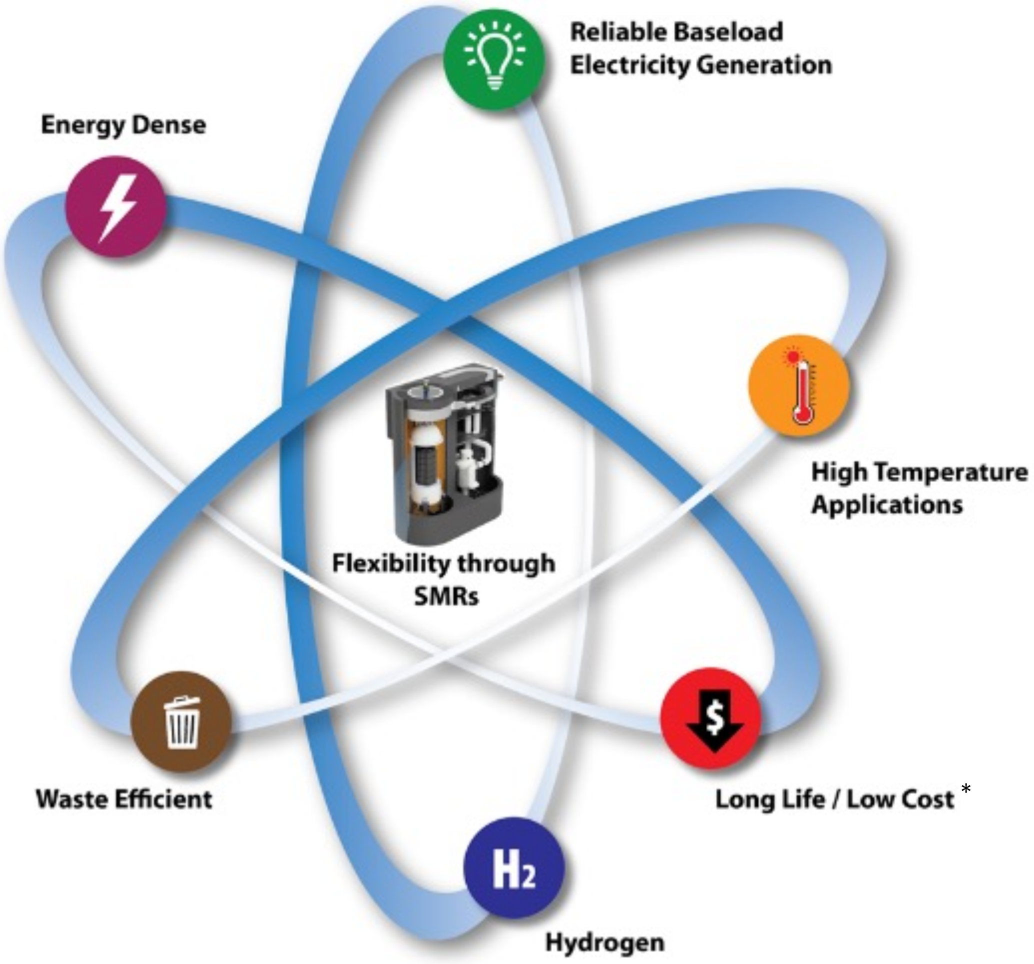
**Hydrogen is an ideal solution where nuclear power plants cannot be constructed**

- Clean hydrogen energy solutions can be supplied to developing nations, by advanced nuclear reactors built in developed nations.




Source: IEA (2018), World Energy Outlook 2018, IEA, Paris https://www.iea.org/reports/world-energy-outlook-2018, License: CC BY 4.0

# THE CASE FOR NUCLEAR




*Low Levelized Cost for Electricity

# HOW TO PARTICIPATE

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# PORTLAND REPLACEMENT OF FOSSIL FUELS ALTERNATIVE FUND

### Investment Objective and Strategy:

The Portland Replacement of Fossil Fuels Alternative Fund's objective is to provide positive long-term total returns by investing primarily in a portfolio of securities focused on companies active in industries which the Manager believes will drive the transition from traditional energy (primarily based on fossil fuels) to sustainable energy sources.

The Fund's investments currently focus on the area of nuclear energy. The Fund also provides professional use of a variable amount of leverage.

### How the Fund is Managed:

The investable universe is global, with a focus on innovative companies active in the area of nuclear energy or supporting the broader effort towards the energy transition.

Portland leverages its existing track record of private placements in companies active in the development and innovation of nuclear medicine as well as its network of industry contacts in making its investment selection.

Investment decisions incorporate fundamental analysis and apply to a value discipline.

Investments are managed with a long-term focus.

### Key Reasons to Invest:

Investments in the fund provides exposure to a secular growth in industries that will help drive the transition from traditional to sustainable energy sources, with a specific focus on nuclear energy.

The focus area of nuclear energy leads to investments in companies that are embedded within the industry's supply chain and making an impact in the development of the nuclear energy industry.

The fund is in close adherence to the Five Laws of Wealth Creation:

1) Own a few high-quality businesses
2) Thoroughly understand these businesses
3) Ensure these businesses are domiciled in strong, long-term growth industries
4) Use other people's money prudently
5) Hold these businesses for the long run

# POTENTIAL PORTFOLIO CONSTRUCTION - FOR ILLUSTRATION PURPOSES

## Portland Replacement of Fossil Fuels Alternative Fund

### NUCLEAR FUEL CYCLE

- Mining & Milling
- Conversion
- Enrichment
- **Fuel Fabrication**
- Uranium: Physical Commodity Exposure

### NUCLEAR PLANT CYCLE

- Design
- Build
- Maintenance and Refurbishment
- Decommissioning
- Waste Management

### OPERATING ASSETS

- Nuclear Focused Utilities
- Small Modular Reactors Micro Modular Reactors
- High Temperature Applications

### ALTERNATIVE ENERGY & SOLUTIONS

- Hydrogen
- Fuel Cells
- Electrolyzers
- Carbon Capture
- Smart Grid Technology

Source: Portland proprietary classifications

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# POTENTIAL PORTFOLIO CONSTRUCTION

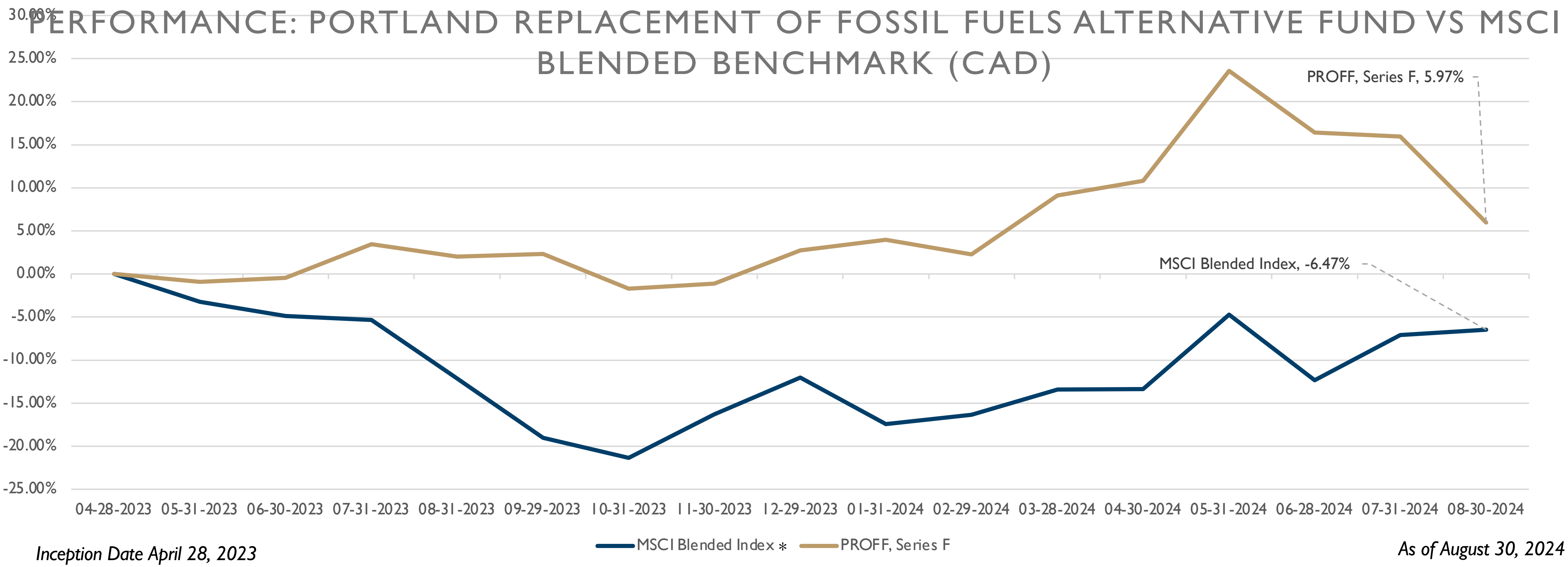
| Sub Sector | RIC | Company Name | Country | Market Capitalization (Millions, CAD) | GICS Industry |
|---|---|---|---|---|---|
| Uranium Mining | PDN.AX | Paladin Energy Ltd | Australia | 2,671.37 | Oil, Gas & Consumable Fuels |
| | UEC.A | Uranium Energy Corp | United States | 2,884.68 | Oil, Gas & Consumable Fuels |
| | DML.TO | Denison Mines Corp | Canada | 1,989.98 | Oil, Gas & Consumable Fuels |
| | UUUU.A | Energy Fuels Inc | United States | 1,082.12 | Oil, Gas & Consumable Fuels |
| | BOE.AX | Boss Energy Ltd | Australia | 1,061.90 | Oil, Gas & Consumable Fuels |
| Uranium Enrichment | LEU.A | Centrus Energy Corp | United States | 869.87 | Oil, Gas & Consumable Fuels |
| | SLX.AX | Silex Systems Ltd | Australia | 840.97 | Machinery |
| Intergrated Nuclear Fuel Cycle | CCO.TO | Cameco Corp | Canada | 23,980.80 | Oil, Gas & Consumable Fuels |
| Nuclear Focused Utilities | CEG.OQ | Constellation Energy Corp | United States | 82,989.97 | Electric Utilities |
| | CEZP.PR | CEZ as | Czech Republic | 27,782.40 | Electric Utilities |
| | ROSNN.BX | Societatea Nationala Nuclearelectrica SA | Romania | 4,033.19 | Electric Utilities |
| | ELE.MC | Endesa SA | Italy | 30,224.50 | Electric Utilities |
| | NEE.N | Nextera Energy Inc | United States | 223,188.27 | Electric Utilities |
| | 9501.T | Tokyo Electric Power Company Holdings Inc | Japan | 10,391.56 | Electric Utilities |
| Small Modular Reactors | ALCC.N | Oklo Inc | United States | 983.52 | Electrical Equipment |
| | SMR.N | Nuscale Power Corp | United States | 2,767.08 | Electrical Equipment |
| Intergrated Nuclear Plant Services | BWXT.N | BWX Technologies Inc | United States | 12,705.37 | Aerospace & Defense |
| Engineering | ASY.PA | Assystem SA | France | 1,195.76 | Professional Services |
| | 052690.KS | KEPCO Engineering & Construction Co Inc | South Korea | 2,589.01 | Construction & Engineering |
| | 034020.KS | Doosan Enerbility Co Ltd | South Korea | 11,704.67 | Electrical Equipment |
| Waste Management | PESI.O | Perma-Fix Environmental Services Inc | United States | 234.52 | Commercial Services & Supplies |
| Physical Uranium | U_u.TO | Sprott Physical Uranium Trust | Canada | 6,577.13 | Capital Markets |
| | YCA.L | Yellow Cake PLC | Jersey | 2,020.21 | Oil, Gas & Consumable Fuels |
| Lithium Operation Plant | PLS.AX | Pilbara Minerals Ltd | Australia | 8,161.37 | Metals & Mining |
| Platinum Group Metals | JMAT.L | Johnson Matthey PLC | United Kingdom | 5,171.68 | Chemicals |
| Hydrogen | PLUG.O | Plug Power Inc | United States | 2,231.36 | Electrical Equipment |
| | BE | Bloom Energy Corp | United States | 3,658.27 | Electrical Equipment |
| | NEL.OL | Nel ASA | Germany | 1,151.31 | Electrical Equipment |
| | BLDP.TO | Ballard Power Systems Inc | Canada | 745.53 | Electrical Equipment |
| | CWR.L | Ceres Power Holdings PLC | United Kingdom | 640.57 | Electrical Equipment |
| | ITM.L | ITM Power PLC | United Kingdom | 545.83 | Electrical Equipment |
| Smart Grid Technology | LANDI.S | Landis+Gyr Group AG | Switzerland | 3,506.85 | Electronic Equipment, Instruments & Components |

As of August 30, 2024 [15]

# PORTLAND REPLACEMENT OF FOSSIL FUELS ALTERNATIVE FUND

Portland Investment Counsel® Buy. Hold. And Prosper.®

## Public Mutual Fund




*Inception Date April 28, 2023*

*As of August 30, 2024*

| Fund Name | YTD | 1 Month | 3 Months | 1 Year | Annualized Since Inception |
|---|---|---|---|---|---|
| Portland Replacement of Fossil Fuels - Series A | 2.50% | -8.68% | -14.49% | 2.87% | 3.33% |
| Portland Replacement of Fossil Fuels, Series F | 3.14% | -8.60% | -14.24% | 3.90% | 4.42% |

*Blended index consists of 50% MSCI World Utilities Index and 50% MSCI Global Alternative Energy Index

The Portland Replacement of Fossil Fuels Alternative Fund (the Fund) does not necessarily invest in the same securities as the benchmark or in the same proportion, the performance of the Fund may not be directly comparable to the benchmark. In addition, the Fund's returns reflect the use of leverage. The use of benchmarks is for illustrative purposes only and is not an indication of performance of the Fund.

# Portland Holdings' Path to All Things Nuclear

**OCTOBER 2018** (Portland Investment Counsel)
Portland Investment Counsel Inc. launches ITM AG Investment Trust, a fund that invests in ITM Isotope Technologies Munich SE, a medical radioisotope supplier and drug developer
itm PASSION FOR PRECISION

**JUNE 2019** (Portland Holdings)
Michael Lee-Chin appointed to the supervisory board of ITM Isotope Technologies Munich SE

**MAY 2019** (Portland Holdings)
International Centers for Precision Oncology Foundation (ICPO) is formed and Michael Lee-Chin is one of founding members
ICPO FOUNDATION

**JULY 2019** (Portland Investment Counsel)
Portland Investment Counsel Inc. leads investment in Telix Pharmaceuticals Limited via private placement
Telix

**MAY 2020** (Portland Holdings)
Michael Lee-Chin is appointed as an advisory board member of OncoBeta International GmbH
ONCOBETA® epidermal radioisotope therapy

**NOVEMBER 2020** (Portland Investment Counsel)
Portland Investment Counsel Inc. launches OncoBeta Investment LP, a fund that invests in OncoBeta International GmbH, a privately held medical device company

**APRIL 2021** (Portland Investment Counsel)
Portland Investment Counsel Inc. launches Portland Life Sciences Alternative Fund

**JULY 2021** (AIC Global Holdings Inc.)
AIC Global Holdings Inc.* appoints Business Development Manager to the Life Sciences Team

**AUGUST 2021**
AIC Global Holdings Inc.* appoints Chief Scientific Officer, Chief Medical Officer
AIC GLOBAL HOLDINGS INC.

**SEPTEMBER 2022** (AIC Global Holdings Inc.)
AIC Global Holdings Inc.*, signs a Memorandum of Understanding to collaborate with Canadian Nuclear Laboratories (CNL)

**DECEMBER 2022** (AIC Global Holdings Inc.)
AIC Global Holdings Inc.* appoints Chief Nuclear Officer

**APRIL 2023** (Portland Holdings Investco Limited)
Portland Holdings Investco Limited* and United Arab Emirates-based MBM Holding of Dubai sign an MOU
MBM HOLDING

**MAY 2023** (Portland Investment Counsel)
Portland Investment Counsel Inc. launches Portland Replacement of Fossil Fuels Alternative Fund

**NOVEMBER 2023** (Portland Holdings Investco Limited)
Portland Holdings Investco Limited launches the institutional-focused Luxembourg-based alternative investment fund "Portland Clean and Nuclear Energy S.L.P."

2018 | 2019 | 2020 | 2021 | 2022 | 2023

*Portland Investment Counsel Inc., and AIC Global Holdings Inc. are subsidiaries of Portland Holdings Limited
Portland Holdings Investco Limited and Portland Holdings Limited are controlled by Michael Lee-Chin

# PORTLAND AFFILIATES' TRACK RECORD

## Canadian Nuclear Laboratories

In September 2022 – AIC Global Holdings Inc. signed a Memorandum of Understanding (MOU) with CNL to collaborate in the areas of clean energy, health sciences and environmental responsibility. Under the terms of the agreement, CNL will contribute scientific and technological knowledge and capabilities, and Portland will provide business expertise and funding support for opportunities jointly developed by the parties. The alliance will center on long term solutions for the decarbonization of global economies and the development of radiopharmaceuticals to combat cancer.

## MBM Holding

In April 2023 - Portland Holdings Investco Limited entered into an MOU with MBM Holding (MBM), one of UAE's most successful and rapidly growing private conglomerates to collaborate on a range of co-investments and partnerships primarily in the areas of nuclear medicine and targeted radionuclide therapy, and nuclear and clean energy. The joint working collaborative initiative will work to support of Dubai's visionary D33 Vision for a sustainable and prosperous future. The partnership further aligns perfectly with the vison of His Highness Mohammed bin Rashid Al Maktoum, ruler of for Dubai and his ambitious plans for economic growth and environmental sustainability.

# INVESTMENT MANAGEMENT TEAM

## Michael Lee-Chin, Executive Chairman, Chief Executive Officer and Portfolio Manager

There is no secret to Michael's business and investment success. He's always been very vocal about his deliberate approach to both. It all started in 1978, when, as a young investment advisor seeking to deliver the highest value add to his clients by making them wealthy, he developed a framework that would guide his principles for life, business and investing. This framework later became known as the '5 laws of wealth creation', which drive his investment behaviour. The '5 laws of wealth creation' are complemented by the 10 traits he seeks in successful businesses.

## Dragos Berbecel,

## Portfolio Manager

Joined Portland Investment Counsel in 2008 leading the ESG/SRI implementation.

Over 25 years of combined operating and investing experience.

Co-led Portland's life-sciences investment efforts since 2018, including private placements of over $95 million by related and connected parties of Portland in ITM Isotope Technologies Munich SE, Telix Pharmaceuticals Limited and OncoBeta® International GmbH, as well as a number of related public mandates.

MBA, Rotman, University of Toronto

CFA Charterholder

# NUCLEAR ADVISORY TEAM – AIC GLOBAL HOLDINGS INC.*

## Christopher Deir, Chief Nuclear Officer

With over 25 years in the Canadian nuclear power industry, Chris brings a wide range of experiences in the development, deployment and operation of nuclear facilities. His current role as Chief Nuclear Officer of AIC Global Holdings Inc. builds on a career that encompasses many facets, including most recently managing Ontario Power Generation (OPG)'s engagements with customers related to the deployment of small modular reactors (SMR) and developing peer utility relationships between OPG and other nuclear utilities within Canada and globally.

Chris worked as a member of the Generation mPower LLC's team on the advancement of the mPower SMR designed by Babcock & Wilcox for its deployment in Canada as well as leading Hitachi Canada Ltd.'s business development activities in the Canadian nuclear market. With a master's degree in nuclear engineering, Chris joined Atomic Energy of Canada Limited as a design engineer for the CANDU product line which led to increasing roles of responsibility as part of the restart efforts of nuclear reactors at both Pickering and Bruce Power. Chris has served as a member of the Board of Directors of the Organization of Canadian Nuclear Industries.

## Rogerio Tippe, Director, International Business Development

Rogerio joined Portland in January 2020 and brings 15 years of experience in the financial industry. He worked at a leading global independent investment bank where he specialized in financing private companies in the Latin America region through PIPE offerings, and took them public via Capital Pool Companies vehicles in Canada. He was also a Director of a US based long-short hedge fund.

Rogerio has experience with natural resources companies in South America, North America and Australia, including providing advisory, trading and research services

Rogerio has experience financing mining companies and their go-public efforts through the capital pool company (CPC) program in the Toronto Stock Exchange

Mr. Tippe holds a Law degree from Universidade Paulista in Sao Paulo, Brazil and received his MBA from the Rotman School of Management, University of Toronto. He has also completed several investment certification courses in Canada.

*an affiliate of Portland Investment Counsel Inc.

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# FUND FEATURES

- Portland Replacement of Fossil Fuels Alternative Fund is a prospectus offered alternative mutual fund.
- CIFSC[16] category of Alternative Equity Focused
  - Fund is expected to be **U.S./North American** centric.
- **Registered Plans** eligible.
- Portland Replacement of Fossil Fuels Alternative Fund is rated as **Medium** risk.
- Management fee from 0.75% per annum for Series F units

| Fund Name | Series A | | | Series F [17] |
|---|---|---|---|---|
| | Code – Initial Sales Charge | Code - DSC | Code- LL | |
| Portland Replacement of Fossil Fuels Alternative Fund | PTL220 | PTL225 | PTL230 | PTL025 |

# RISKS

- Portland believes the following risks may impact the performance of the Fund:
  - Concentration risk
  - Commodity risk
  - Nuclear energy and sustainable energy sector investment risk
  - Geopolitical risk
  - Energy crisis risk
  - Specialization risk
  - Currency risk
  - Equity risk

- Please read the “What are the risks of investing in the Fund?” section in the Simplified Prospectus for a more detailed description of all the relevant risks.

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# APPENDIX

## REFERENCES


1. United Nations Environment Programme, 2011
2. https://ourworldindata.org/emissions-by-fuel
3. https://ourworldindata.org/greenhouse-gas-emissions#:~:text=Carbon%20dioxide%20was%20the%20largest,SF6)%2C%202.1%25
4. https://ourworldindata.org/co2-emissions
5. https://ourworldindata.org/emissions-by-sector
6. https://www.iea.org/data-and-statistics/charts/minerals-used-in-clean-energy-technologies-compared-to-other-power-generation-sources, IEA. Licence: CC BY 4.0
7. https://ourworldindata.org/land-use-per-energy-source
8. https://about.bnef.com/blog/global-low-carbon-energy-technology-investment-surges-past-1-trillion-for-the-first-time/
9. https://about.bnef.com/blog/the-renaissance-of-nuclear-power-to-accommodate-net-zero-by-2050-new-energy-outlook-2021/
10. https://ourworldindata.org/nuclear-energy#:~:text=A%20death%20rate%20of%200.04,50%20years%20would%20someone%20die
11. https://world-nuclear.org/nuclear-essentials/how-is-uranium-made-into-nuclear-fuel.aspx
12. https://www.iaea.org/newscenter/news/what-are-small-modular-reactors-smrs
13. U.S. Department of Energy
14. OECD Publication: ISBN 978-92-64-11510-1
15. Company information and details are Eikon sourced
16. Canadian Investment Funds Standards Committee
17. Generally available through dealers who have entered into a Portland Series F Dealer Agreement.

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## DISCLOSURES

Certain statements included in this document constitute forward-looking statements, including those identified by the expressions 'anticipate', 'believe', 'plan', 'estimate', 'expect', 'intend', and similar expressions to the extent they relate to a security. The forward-looking statements are not historical facts, but reflect the Portfolio Management team's current expectations regarding future results or events. These forward-looking statements are subject to a number of risks and uncertainties that could cause actual results or events to differ materially from current expectations. The Portfolio Management team has no specific intention of updating any forward-looking statements whether as a result of new information, future events or otherwise.

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Information provided is believed to be reliable when published. All information is subject to modification from time to time without notice. Every effort has been made to ensure the utmost accuracy of the information provided. Information provided is believed to be reliable when posted.

Commissions, trailing commissions, management fees and expenses all may be associated with mutual fund investments. Mutual funds are not guaranteed, their values change frequently and past performance may not be repeated.



Portland Investment Counsel Inc., 1375 Kerns Road, Suite 100, Burlington, Ontario  L7P 4V7 Tel: 1-888-710-4242 • www.portlandic.com • info@portlandic.com

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