

# **Nuclear Power as an alternative for emission free power generation**

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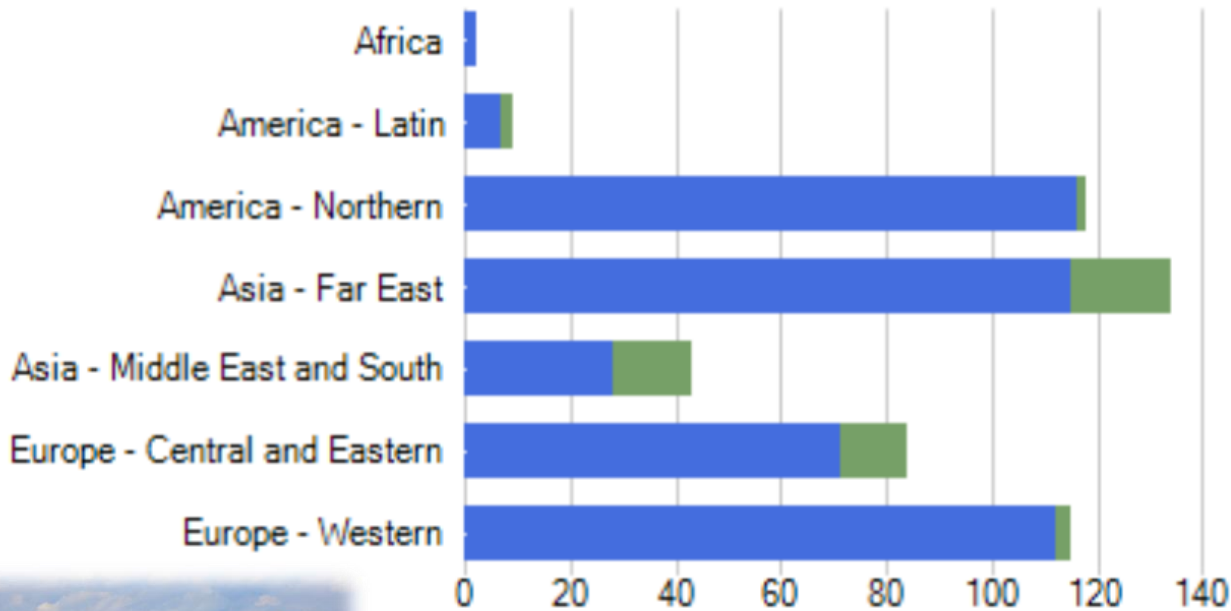
**International Atomic Energy Agency**

*Vienna Energy Transition Forum*



*IENE*

*Vienna, 6-7 June 2019*

# Global nuclear power status



# countries

 Operational	30
 Under Construction	18 (4 new)

451 NUCLEAR POWER REACTORS IN OPERATION

398 677 MW<sub>e</sub> TOTAL NET INSTALLED CAPACITY

54 NUCLEAR POWER REACTORS UNDER CONSTRUCTION

55 364 MW<sub>e</sub> TOTAL NET INSTALLED CAPACITY

18 055 REACTOR-YEARS OF OPERATION



# The International Atomic Energy Agency



## IAEA Quick Facts

<b>Year Founded</b>	1957	<b>Headquarters</b>	Vienna, Austria
<b>Member States</b>	170	<b>Liaison Offices</b>	Geneva, Switzerland New York, USA
<b>Number of Employees</b>	ca. 2,500	<b>Regional Offices</b>	Toronto, Canada Tokyo, Japan
<b>Laboratories</b>	14	<b>Regular Budget</b>	€362.5 million

## Our Role

“It is each country’s sovereign decision whether to add nuclear power to its energy mix. For those who choose to do so, the IAEA role is to help them build the expertise to use nuclear power safely, securely and sustainably.”  
DG Amano

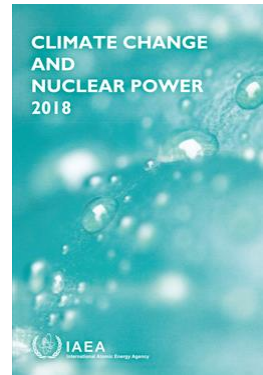


Publications

Tools

Databases

Services



International Conference on

# Climate Change and the Role of Nuclear Power

7–11 October 2019, Vienna, Austria



Organized by the



**#Atoms4Climate**

CN-275



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# The Climate Change Challenge

**TODAY**

**70%**

of electricity  
comes from  
burning fossil fuels



**2050**

**80%**

of electricity  
will need to be  
low carbon

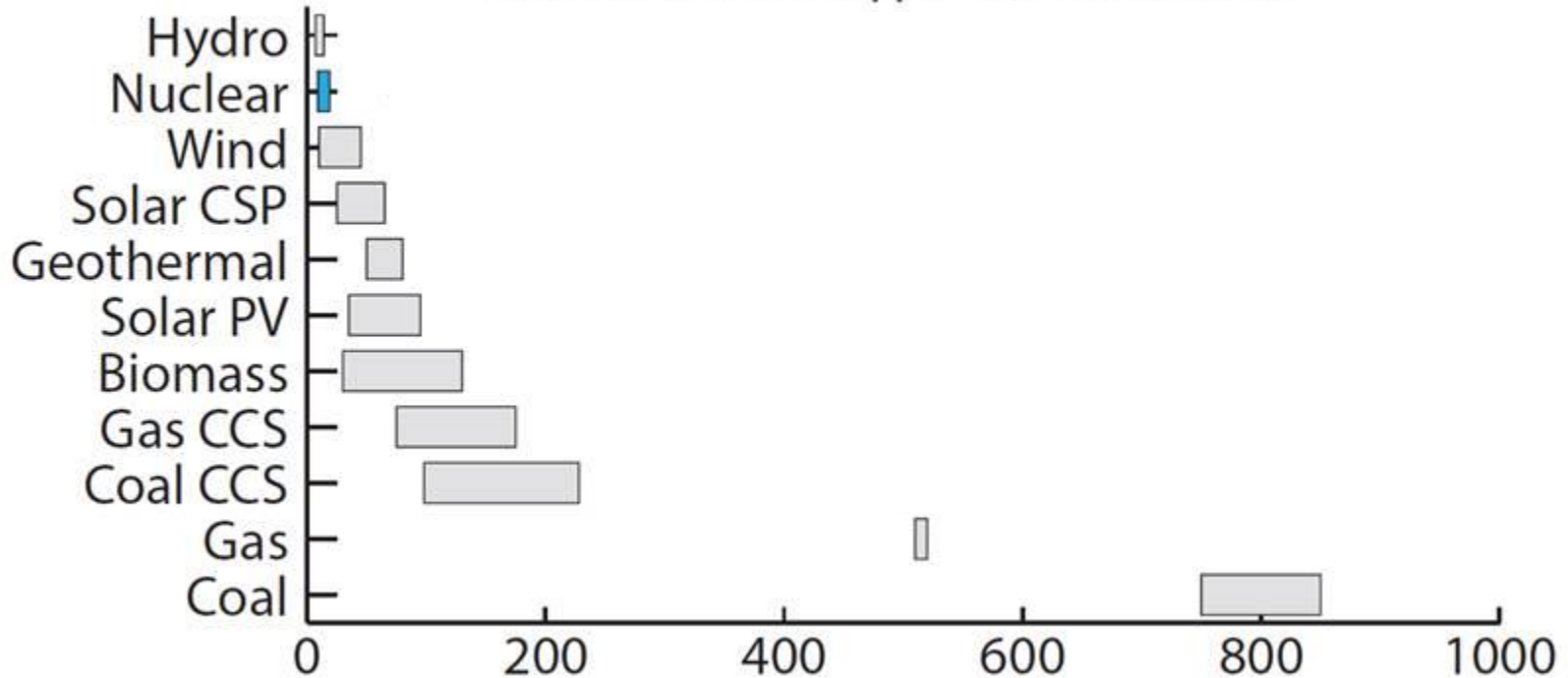


Today, nuclear energy represents one of the largest contributors to low carbon energy, supplying 1/3 of available low carbon electricity.

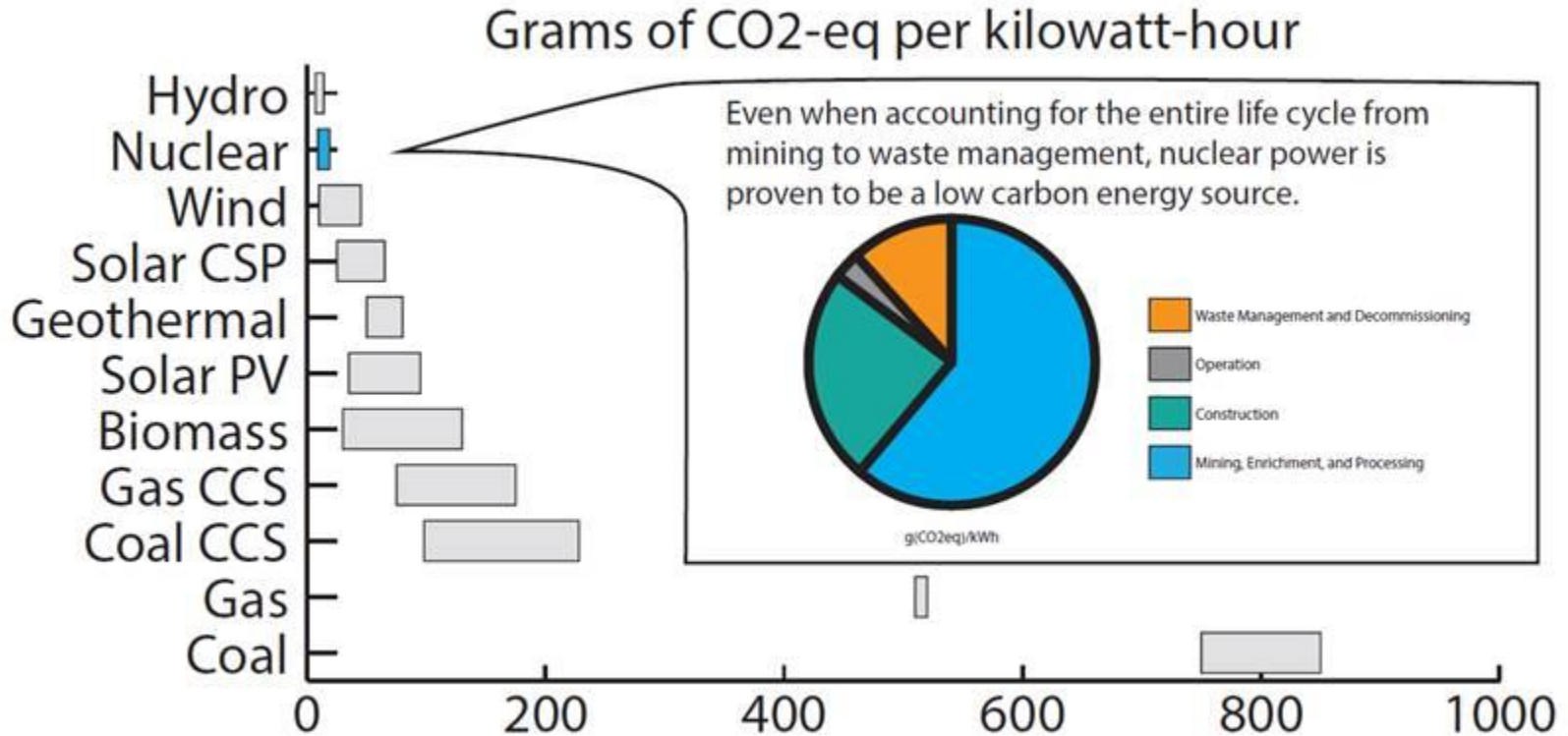
(when limiting temperature rise to 2° C above pre-industrial levels)

# CO<sub>2</sub> emissions: comparison of electricity generating technologies

Grams of CO<sub>2</sub>-eq per kilowatt-hour



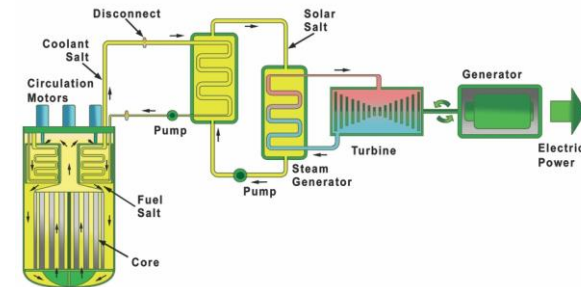
# CO<sub>2</sub> emissions: comparison of electricity generating technologies



# Development potential: current and future technologies

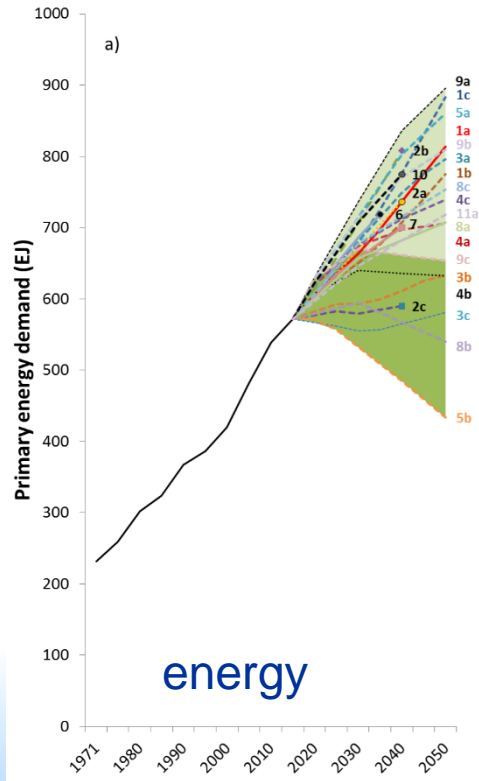
Nuclear power still has a significant development potential:

- Up to 60% higher fuel efficiency (and correspondingly less waste)
- Significantly lower off-site effects in case of an accident
- Markets beyond electricity, e.g.:
  - Hydrogen production from electrolysis
  - Drinking water production by desalination



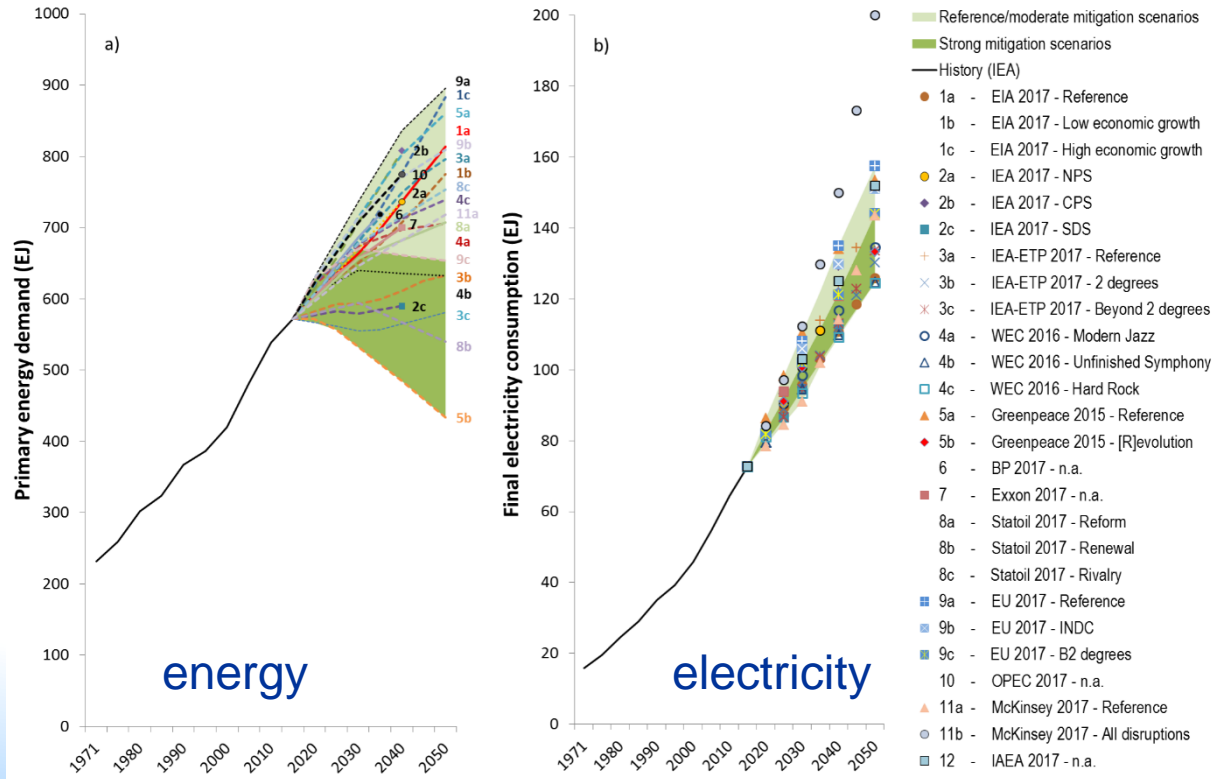


# Demand challenge



- Reference/moderate mitigation scenarios
- Strong mitigation scenarios
- History (IEA)
- 1a - EIA 2017 - Reference
- 1b - EIA 2017 - Low economic growth
- 1c - EIA 2017 - High economic growth
- 2a - IEA 2017 - NPS
- ◆ 2b - IEA 2017 - CPS
- 2c - IEA 2017 - SDS
- + 3a - IEA-ETP 2017 - Reference
- × 3b - IEA-ETP 2017 - 2 degrees
- × 3c - IEA-ETP 2017 - Beyond 2 degrees
- 4a - WEC 2016 - Modern Jazz
- △ 4b - WEC 2016 - Unfinished Symphony
- 4c - WEC 2016 - Hard Rock
- ▲ 5a - Greenpeace 2015 - Reference
- ◆ 5b - Greenpeace 2015 - [R]evolution
- 6 - BP 2017 - n.a.
- 7 - Exxon 2017 - n.a.
- 8a - Statoil 2017 - Reform
- 8b - Statoil 2017 - Renewal
- 8c - Statoil 2017 - Rivalry
- 9a - EU 2017 - Reference
- 9b - EU 2017 - INDC
- 9c - EU 2017 - B2 degrees
- 10 - OPEC 2017 - n.a.
- ▲ 11a - McKinsey 2017 - Reference
- 11b - McKinsey 2017 - All disruptions
- 12 - IAEA 2017 - n.a.

# Demand challenge



# Take-away message

Decarbonization of the electricity sector is a double challenge:

1. a large fossil share to be replaced by low-carbon technologies, and
  2. a fast growth in the coming decades
- all low carbon technologies need to be utilized, optimized to cost and geography.

“The Agency’s latest annual projections show that nuclear power will continue to play a key role in the world’s low-carbon energy mix. Without significant progress on using the full potential of nuclear power, it will be difficult for the world to secure sufficient energy to achieve sustainable development and to mitigate climate change.”



**IAEA**

International Atomic Energy Agency  
*Atoms for Peace and Development*

Thank you!

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