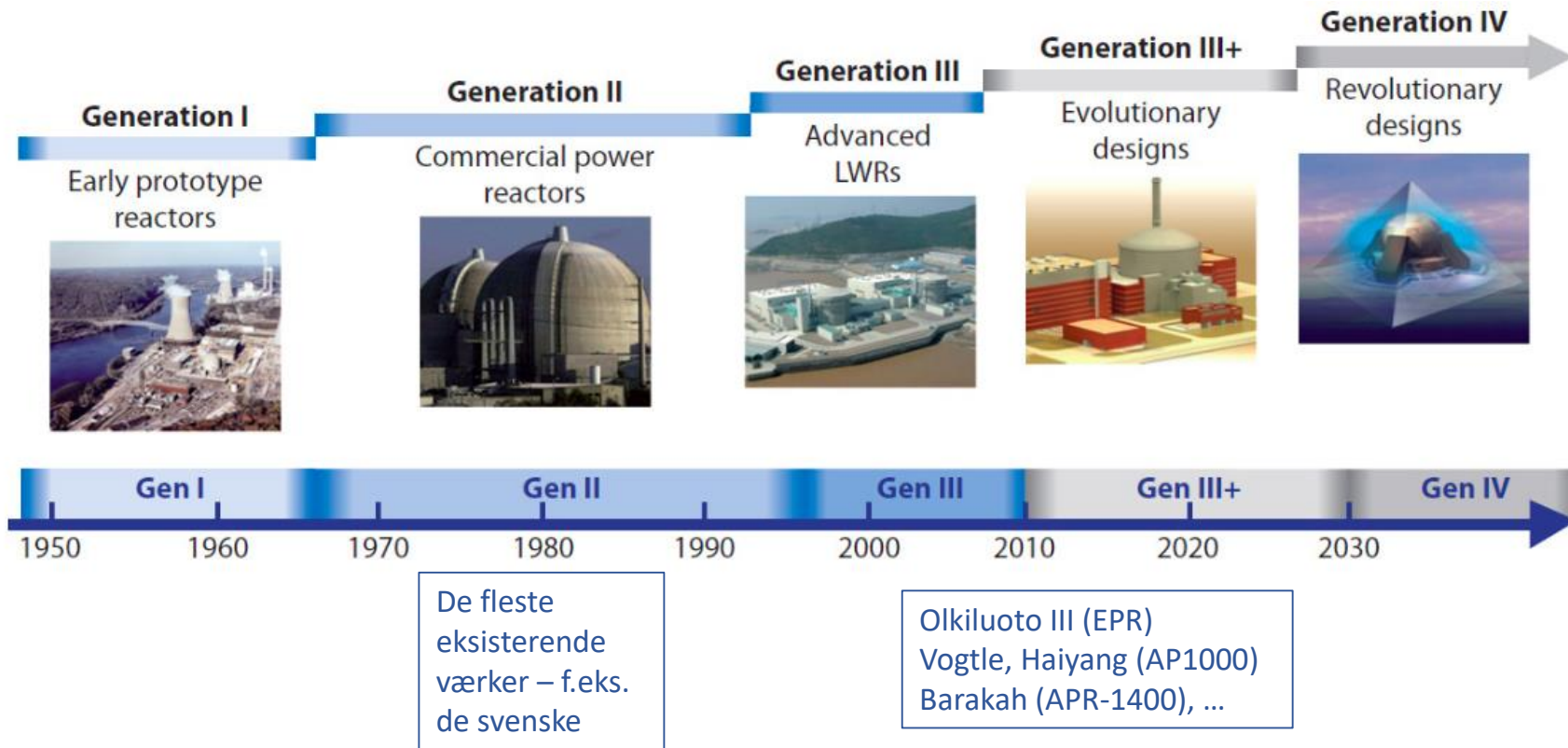


# Typer af atomreaktorer

Credit: Brookhaven National Lab

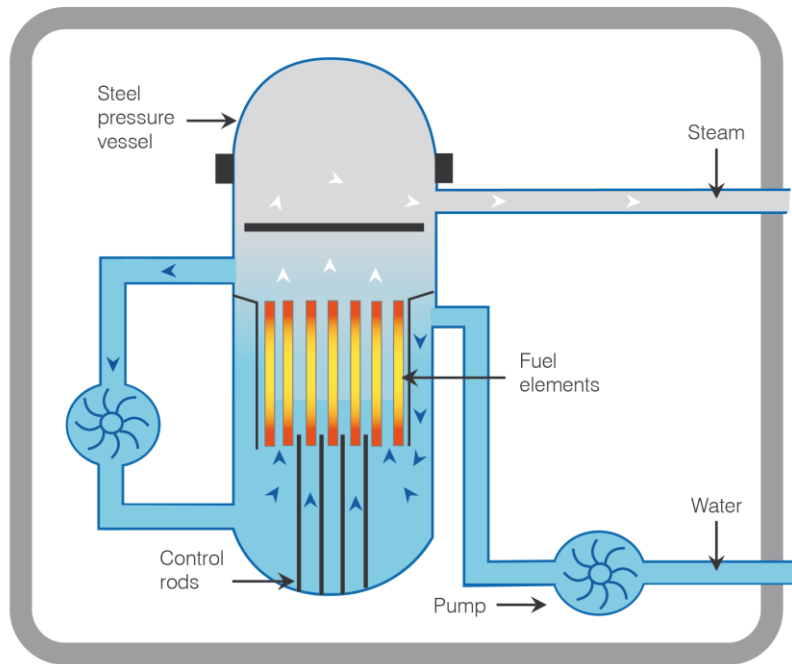


# Kogevands- og trykvandsreaktorer

WORLD NUCLEAR ASSOCIATION

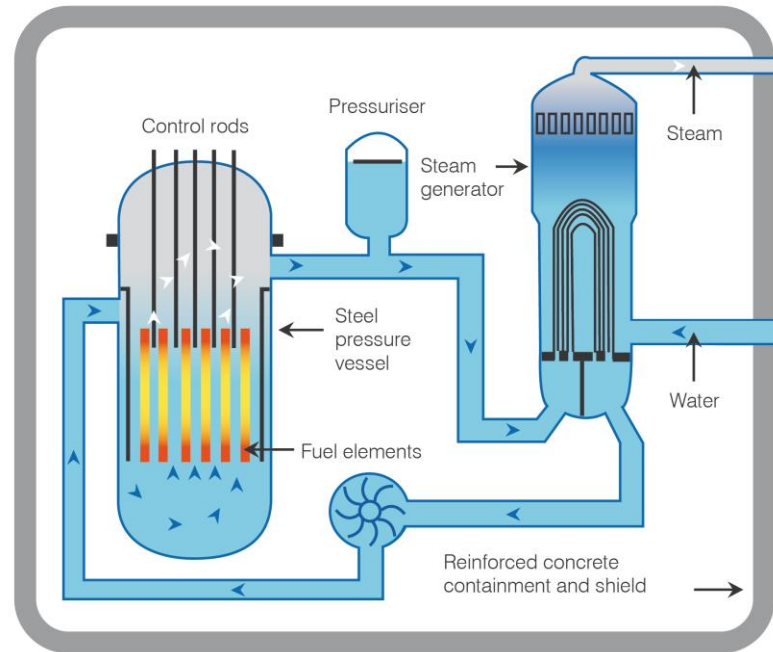
A Boiling Water Reactor (BWR)

WORLD NUCLEAR ASSOCIATION



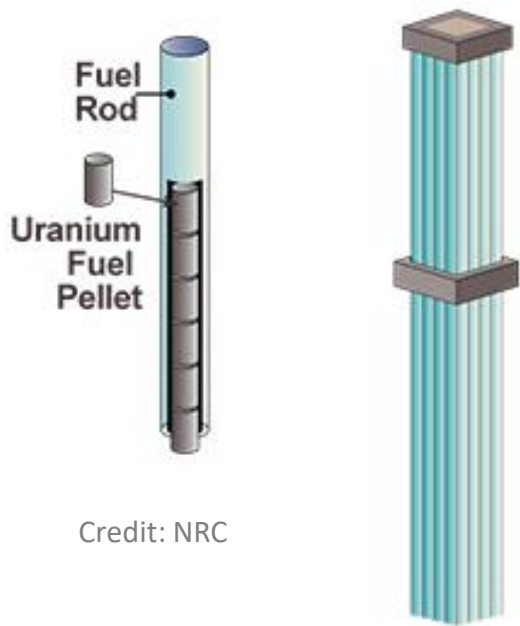
F.eks. Forsmark 1-3, Oskarshamn 3, Olkiluoto 1-2

A Pressurized Water Reactor (PWR)



F.eks. Ringhals 3-4, Olkiluoto 3

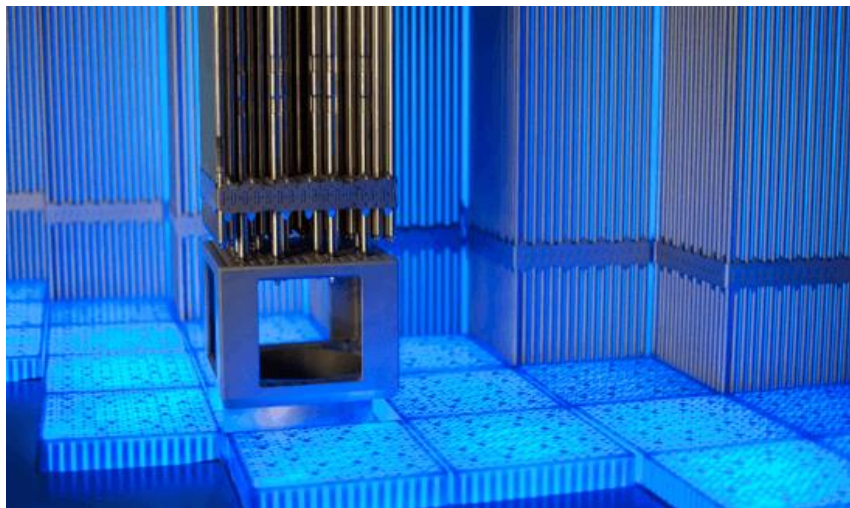
# Brændsler i traditionelle kernereaktorer



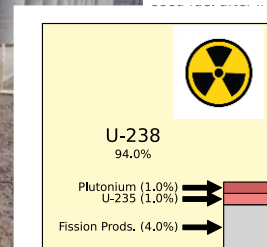
Credit: NRC

1GW kernekraft: ca. 30 tons Uran / år (1-2 m<sup>3</sup>)

Danske termiske kraftværker: 100-200 tons kul/biomasse i timen

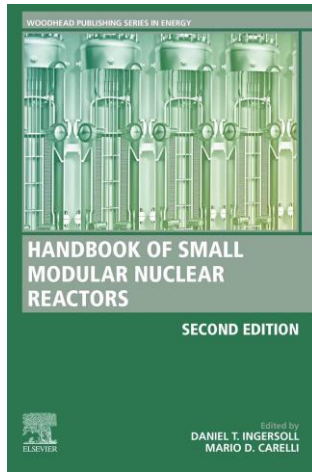
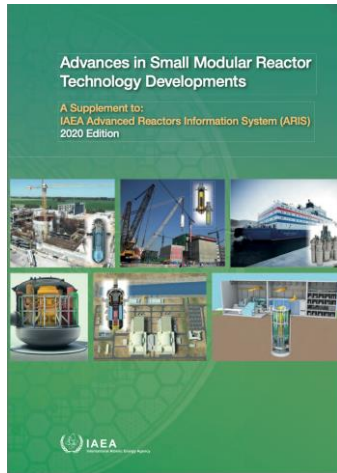
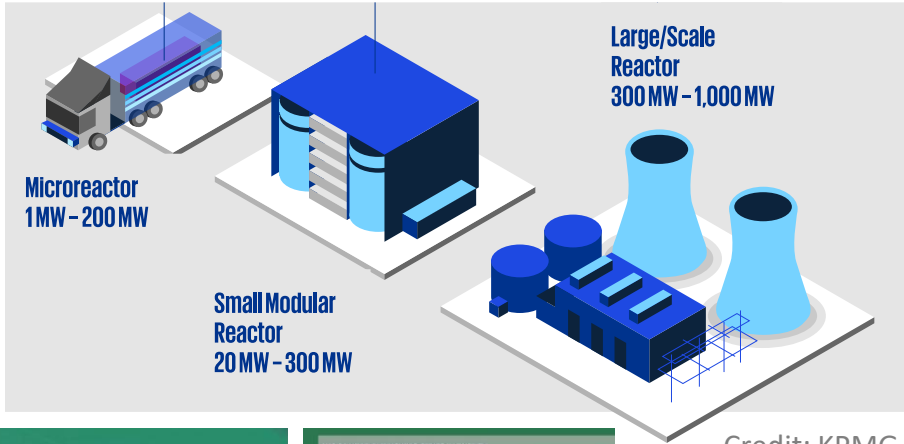


Credit: Energy for humanity



Typical LWR waste

# SMR og Generation IV



## Avancerede reaktorer

Arriving - 2030 →

**Bæredygtighed**

**Effektivitet**

**Økonomi**

**Sikkerhed**

**Ikke-spredning**

Technologies:

- GFR
- LFR
- MSR
- SFR
- SCWR
- VHTR

Thorium Molten Salt Breeder Reactor

TerraPower TWR®  
Traveling Wave Reactor

Kairos Power  
Hermes Reactor

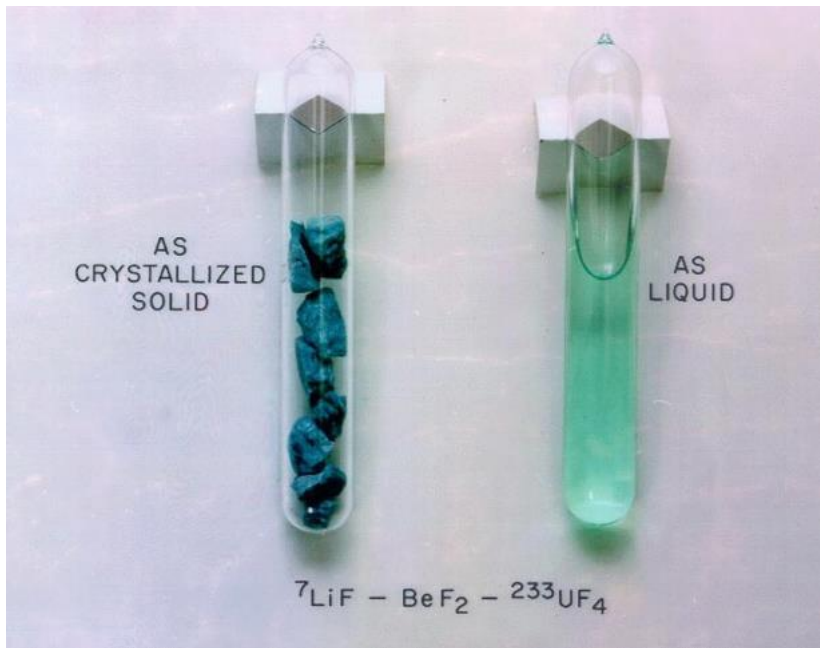
  

Uranium-based  
Molten Salt Reactor

Gen-4.org



# Nye typer brændsel



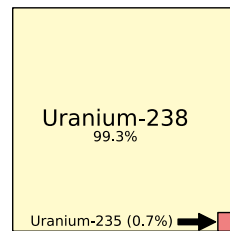
Credit: Oak Ridge National Lab

Flydende brændsel

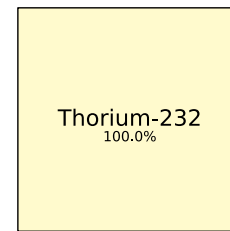
“Triso” brændsel



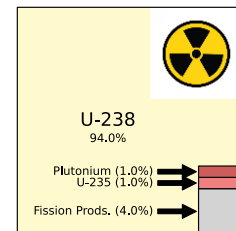
Credit: DOE



Natural Uranium



Natural Thorium



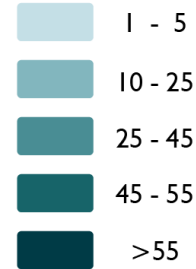
Typical LWR waste

Formeringsreaktorer: “fissile from fertile”  
Åbne og lukkede brændselscykler  
Berigningsgrader: LEU (<5%) og HALEU (5-20%)

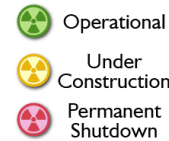
# Kernkraft i Europa

COUNTRY (Click name for Country Profile)	REACTORS OPERABLE		REACTORS UNDER CONSTRUCTION		REACTORS PLANNED		REACTORS PROPOSED	
	April 2023		April 2023		April 2023		April 2023	
	No.	MWe net	No.	MWe gross	No.	MWe gross	No.	MWe gross
<a href="#">Belgium</a>	5	3928	0	0	0	0	0	0
<a href="#">Bulgaria</a>	2	2006	0	0	1	1000	3	3000
<a href="#">Czech Republic</a>	6	4212	0	0	1	1200	3	3600
<a href="#">Finland</a>	5	4394	0	0	1	1170	0	0
<a href="#">France</a>	56	61,370	1	1650	0	0	6	9900
<a href="#">Germany</a>	0	0	0	0	0	0	0	0
<a href="#">Hungary</a>	4	1916	0	0	2	2400	0	0
<a href="#">Lithuania</a>	0	0	0	0	0	0	2	2700
<a href="#">Netherlands</a>	1	482	0	0	0	0	2	2000
<a href="#">Poland</a>	0	0	0	0	0	0	6	6000
<a href="#">Romania</a>	2	1300	0	0	2	1440	1	720
<a href="#">Slovakia</a>	5	2308	1	471	0	0	1	1200
<a href="#">Slovenia</a>	1	688	0	0	0	0	1	1000
<a href="#">Spain</a>	7	7123	0	0	0	0	0	0
<a href="#">Sweden</a>	6	6885	0	0	0	0	0	0
<b>EU Total</b>	<b>100</b>	<b>96,664</b>	<b>2</b>	<b>2121</b>	<b>7</b>	<b>7210</b>	<b>25</b>	<b>30,120</b>
	<b>No.</b>	<b>MWe</b>	<b>No.</b>	<b>MWe</b>	<b>No.</b>	<b>MWe</b>	<b>No.</b>	<b>MWe</b>

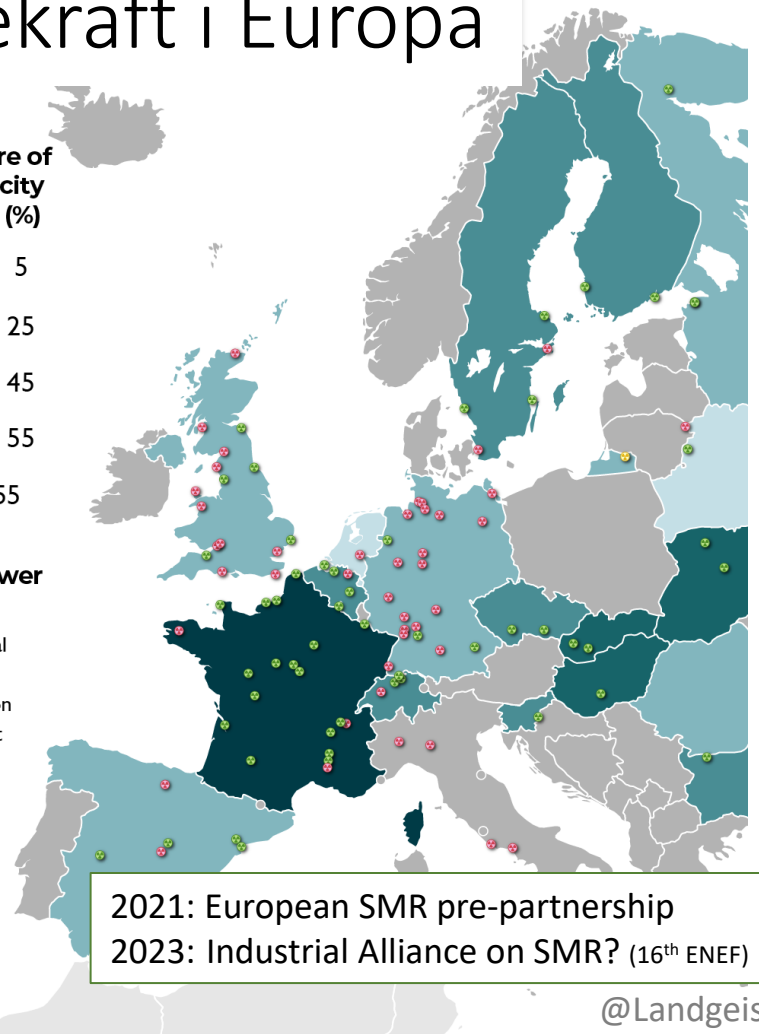
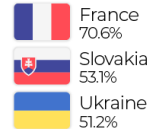
## Nuclear share of total electricity generation (%)



## Nuclear power plant\*



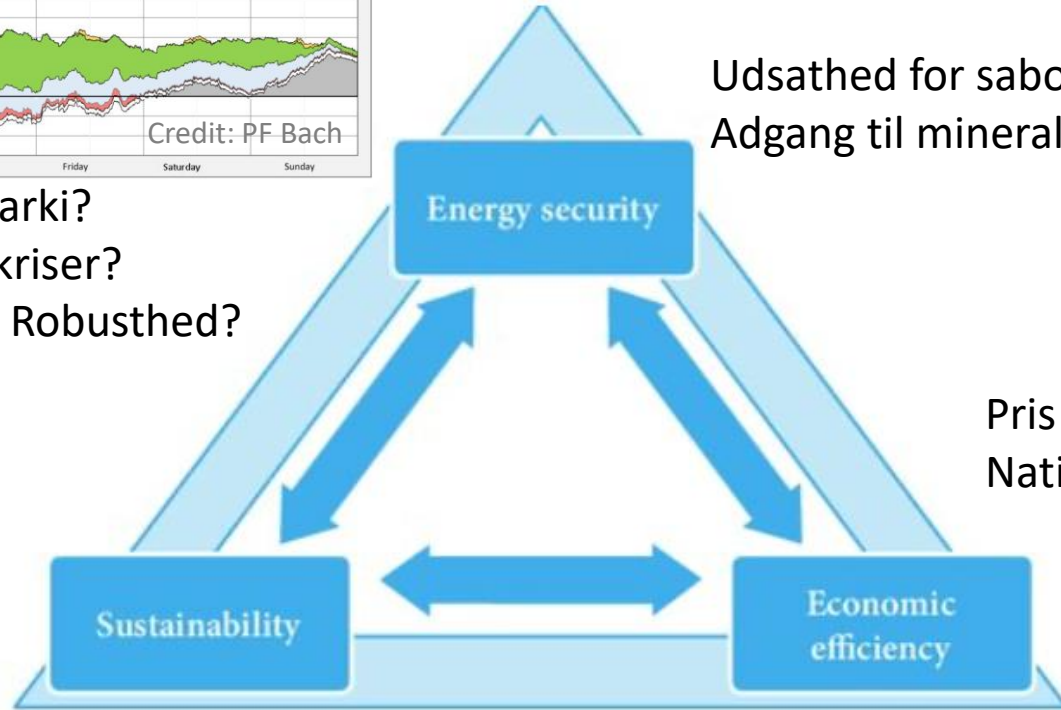
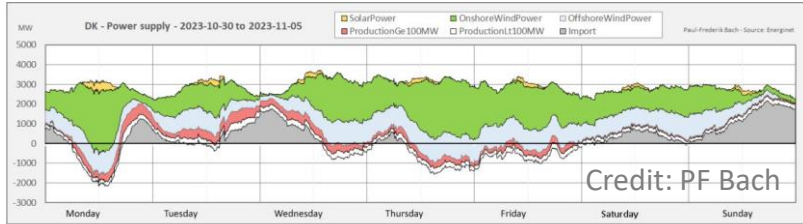
## Highest



2021: European SMR pre-partnership  
2023: Industrial Alliance on SMR? (16<sup>th</sup> ENEF)

Source: IAEA, 2020

# Energipolitik: Fordele, ulemper og alternativer



Udsathed for sabotage?  
Adgang til mineraler og brændsler?

Pris og prisstabilitet?  
Nationale erhvervsinteresser?  
Forsyningskæder?  
Flaskehalse?  
Finansiering?

Energi-autonomi / autarki?  
Forsyningsikkerhed i kriser?  
Effekttilstrækkelighed, Robusthed?

Footprint? Miljø? Klima? Borgerinddragelse?  
Deponi af brændsel? Adgang til mineraler?  
Risiko for uheld? Dekommissionering af anlæg?

Credit: Cornelia Ulbert

