REA

ENERGY TRANSITION READINESS INDEX 2024

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Presented by Mark Sommerfeld
Deputy Director of Policy, REA

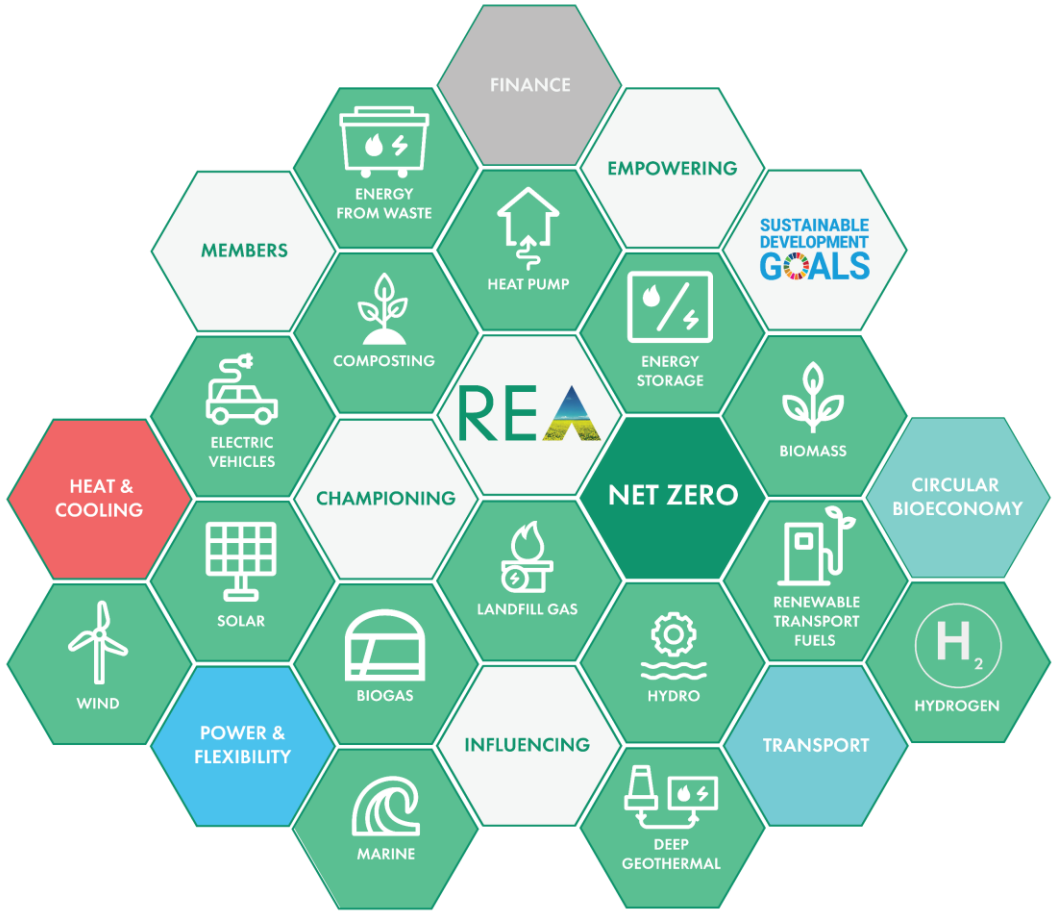
About the REA

A Future Built on Renewable Energy and Clean Technology

A world that has surpassed fossil fuels; where clean technologies and renewable energy is accessible for all.

We, the REA, are a coalition built to promote renewable energy and clean technologies.

- 20+ years experience from London to the world, with 550+ members.
- Inclusive membership, open to all technologies and service providers in the low carbon energy sector.
- Influencing policy makers and solving sector-specific issues, a core cross-technology workstream for the REA is in promoting electricity system flexibility.



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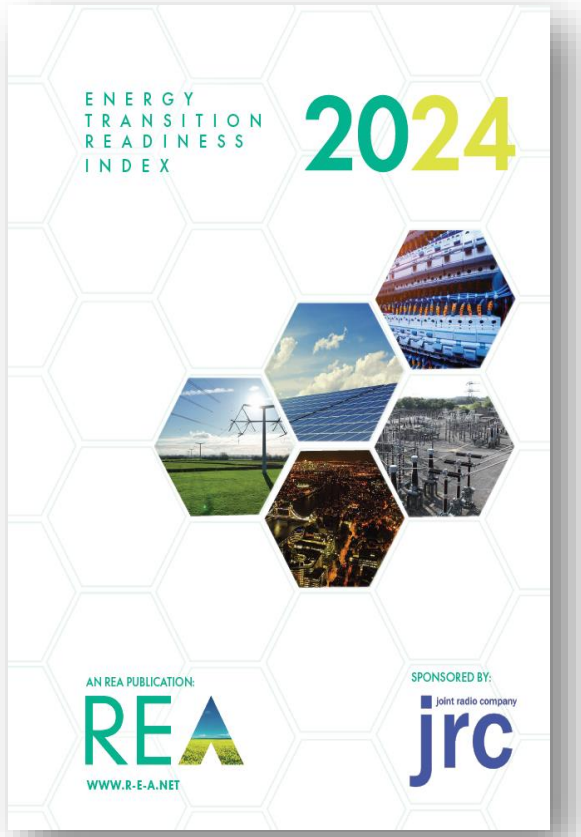
The ETRI Series



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Flexibility Market in 2024

The **Energy Transition Readiness Index 2024** report explores:

Energy Transition Progress Over the Last 10 years

Patterns over the last four ETRI reports

Meeting 2030 ambitions

Demand Side flexibility - Emerging Issues

- Data centres
- Electricity Storage
- Smart Grid Communications

Flexibility needs in 2030

Consistent Barriers to Flexibility

Photo by Matthew Henry on Unsplash

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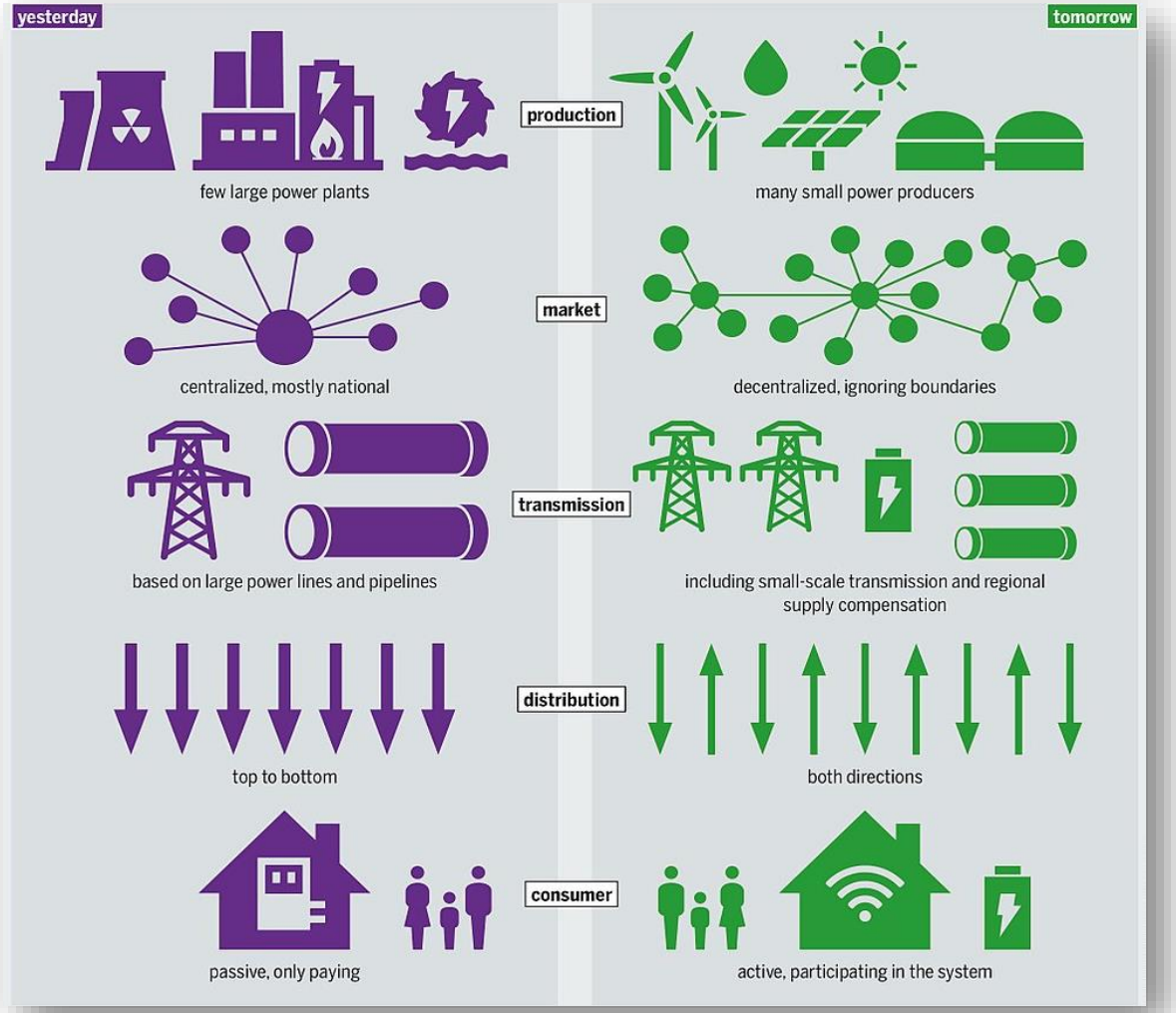
What is Flexibility?

Energy Transition Readiness Index 2024

- **Enabling Net Zero**
- **Reduce energy waste and electricity cost**
- **Promote energy security**

"Flexibility (or 'dispatchability') is the ability of electricity generation or customer demand to increase or decrease supply and demand. Flexibility resources are needed on a continuous basis to stabilise the electricity system within operational limits, especially when unexpected changes occur."

- Energy Transition Readiness Index 2023



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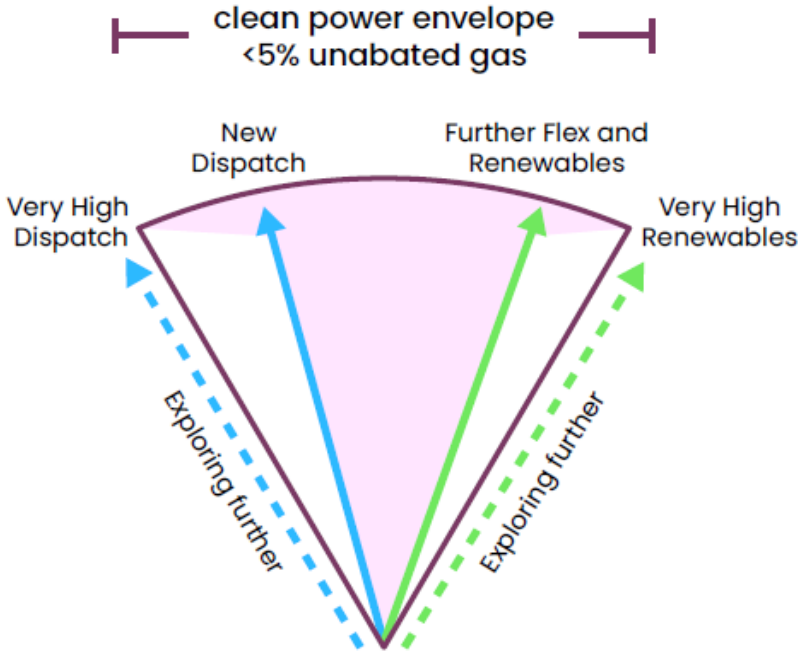
NESO CLEAN POWER ADVICE 2030

Electricity Demand : could rise by ~11% by 2030

Electricity Supply:
- Offshore wind 43-50 GW (15 GW today)
- Solar 47 GW (15 GW today)
- Battery Storage 22 GW (5GW today)
- LDES and Dispatchable resources required.

Electricity Networks – Network expansion- twice as much in half the time.

Connection Reform – Link technology, capacity needed and location in Spatial Plan.



All pathways see increased electrification of transport, heat and industry by 2030 as needed to meet economy-wide carbon targets. Energy efficiency improvements continue across both pathways. Clean power pathways will all require increased digitalisation, open data and Innovation.

New Dispatch	Further Flex and Renewables
• Growth in renewables but at a lower level compared to Further Flex and Renewables. • Deployment of new low carbon dispatchable power (CCS and hydrogen) alongside highest nuclear capacity.	• Highest levels of societal engagement, with higher residential and industrial demand flexibility and more storage. • Fast deployment of renewables (50 GW offshore wind), but no new dispatchable power.

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NESO CLEAN POWER ADVICE 2030 – System Flexibility

Achieving a clean power electricity system requires replacing fossil fuel flexibility with low carbon flexibility.

- **Battery Capacity** 5GW in 2023 to 23-27 GW in 2030.

- **Long Duration Energy Storage**, 5 – 8 GW needed by 2030. And a lot more beyond that.

- **Low carbon dispatchable power** and unabated gas-fired generation will provide flexibility.
  - BECCS Capacity of 3.8 – 4 GW
  - Biomethane
  - Hydrogen

- **Interconnectors:** 8 GW in 2023 to 12 GW in 2030

Access to the right data and the development of digital infrastructure will be vital to using these and other resources efficiently.

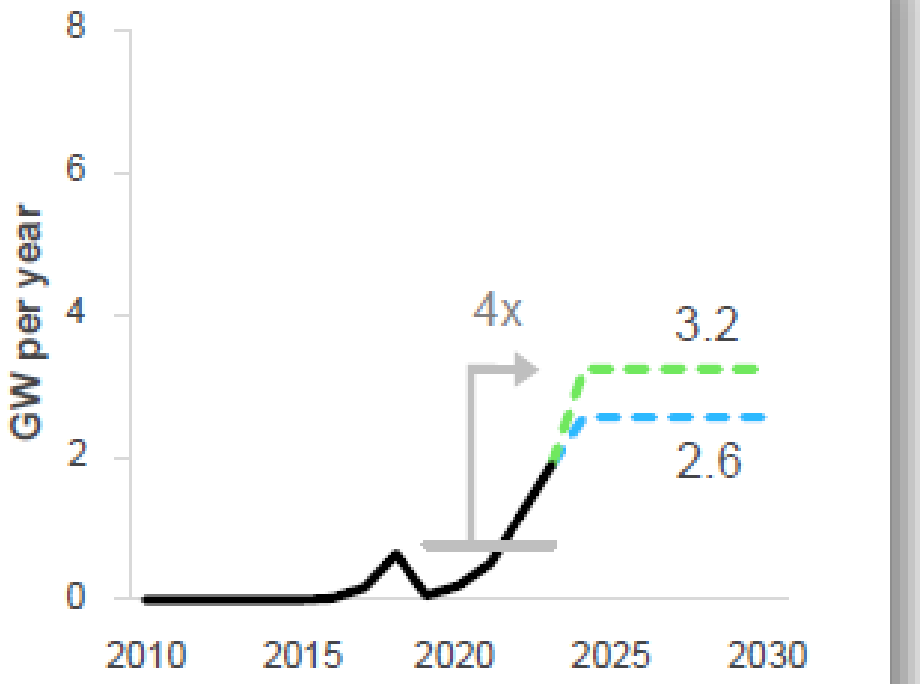

Figure 4: Batteries scale up needed

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NESO CLEAN POWER ADVICE 2030 – Demand Side Flexibility

Smart technologies provide new ways for consumers to engage and flex demand

CP 2030 needs a four time increase in demand flexibility.

Demand flexibility reaches 10-12 GW through smart charging of electric vehicles, time-shifting household demand and enabling more responsive industrial demand, with a further 4 GW from storage heating.

Engagement must be supported by a transformation in data and digital infrastructure, including abilities to enable automated participation.

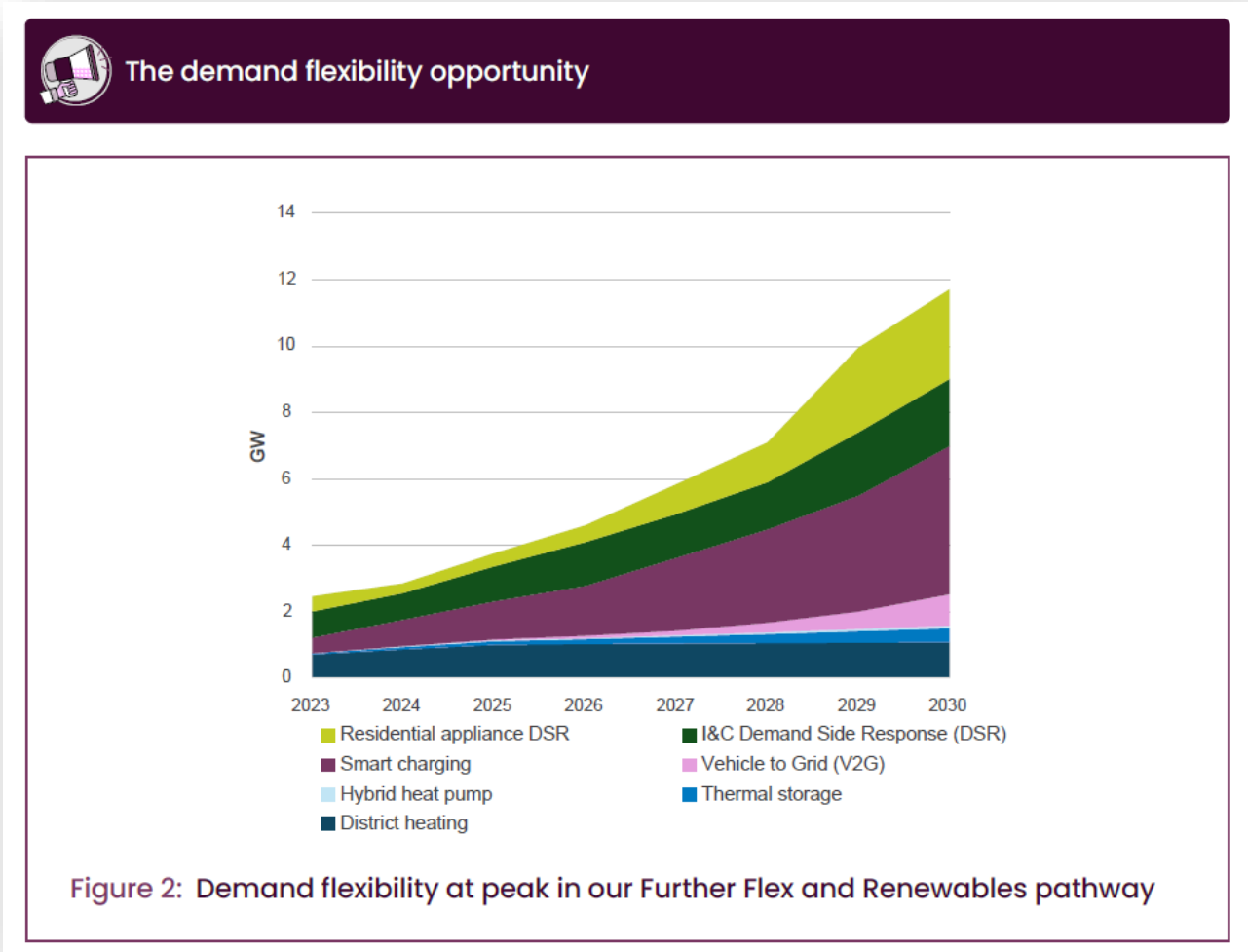

Figure 2: Demand flexibility at peak in our Further Flex and Renewables pathway

Introduction to ETRI 2024

- ETRI reports have been produced since 2019 assessing energy transition readiness, focusing on investment attractiveness for flexibility resources
  - Investor views are assessed on socio-economic, technology enablers and market access factors
  - ETRI assesses 14 European countries, representing 85% of total European electricity demand

- This 2024 provides an update on changes in the electricity markets in these 14 countries, including:
  - Generation market dynamics
  - Progress of demand-side flexibility and technology enablers
  - The latest flexibility gap to 2030

ETRI 2023 Transition Progress

Score	2023
5	
High 4	Norway
Low 4	Denmark, Finland, Sweden
High 3	France, Ireland, Netherlands, UK
Low 3	Germany, Italy, Spain
High 2	Greece, Switzerland
Low 2	Poland
1	

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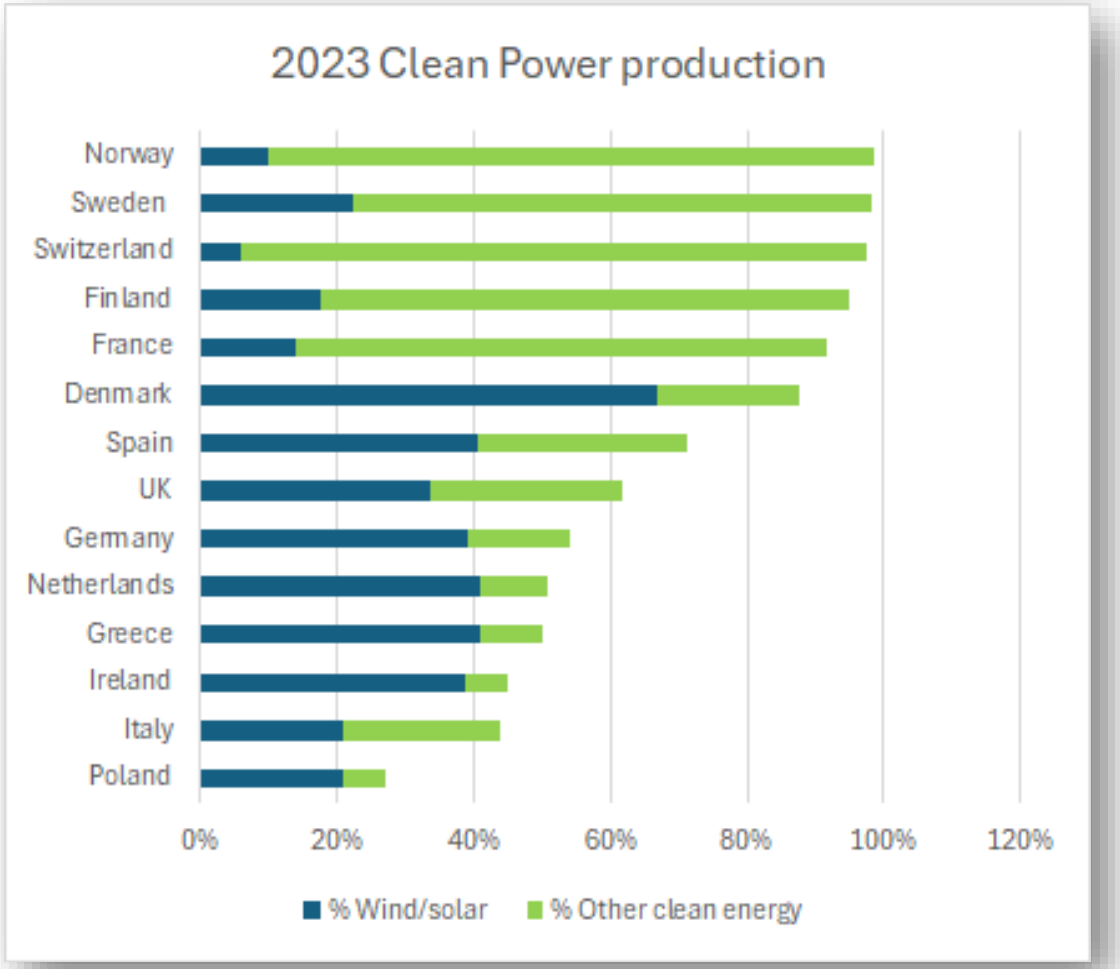
2023: Clean Power Production – ETRI14

- Clean Power (comprising hydro, nuclear, biomass, wind and solar) has increased by 10% over the last 10 years reaching 69% of total electricity production.
- Solar and wind production now totals 27% of all production, up from 11% 10 years ago.
- Demand fell by 3% from 2022 due to the lasting impact of the energy crisis



Country	% Clean Power
Norway	99%
Sweden	98%
Switzerland	98%
Finland	95%
France	92%
Denmark	88%
Spain	71%
UK	62%
Germany	54%
Netherlands	51%
Greece	50%
Ireland	45%
Italy	44%
Poland	27%

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2023: Demand side flexibility and enablers

- ***Electric Vehicles*** – Norway continues to lead in percentage terms, but number of vehicles is higher inn Germany, UK and France.
- ***Heat Pumps*** – Nordic countries continue to lead, but high numbers are evident in Italy, Spain, Germany.
- ***Battery storage*** – Germany, UK and Italy are leading. 120GW forecast for 2030.
- ***Data centres*** – an additional 10GW forecast by 2027.

Figure 5: 2023 Demand-side flexibility resources and enablers

	Electric vehicles			Heat Pumps			Enabling Technologies	
	BEV Total ('000's)	BEV % of total fleet	BEV % of new registrations	Total ('000's)	HP % of total homes	HP % increase in 2023	Battery Storage (GW)	Smart Meter penetration
Denmark	243	4%	41%	665	23%	9%	n/a	100%
Finland	103	1%	24%	1452	52%	8%	0.2	100%
France	1,097	2%	15%	4544	15%	14%	0.9	92%
Germany	1,696	2%	12%	2082	5%	26%	8.0	14%
Greece	18	0%	4%	n/a	n/a	n/a	0.1	4%
Ireland	72	1%	12%	87	5%	39%	0.8	57%
Italy	303	0%	4%	3519	14%	10%	3.9	100%
Netherlands	524	3%	26%	622	7%	46%	0.4	88%
Norway	782	18%	73%	1728	72%	6%	0.0	98%
Poland	61	0%	3%	693	5%	23%	0.0	29%
Spain	213	0%	5%	1466	8%	16%	0.2	100%
Sweden	358	4%	31%	2547	46%	6%	0.1	100%
Switzerland	192	2%	16%	492	13%	13%	0.3	20%
UK	1,152	2%	15%	442	1%	16%	4.0	61%

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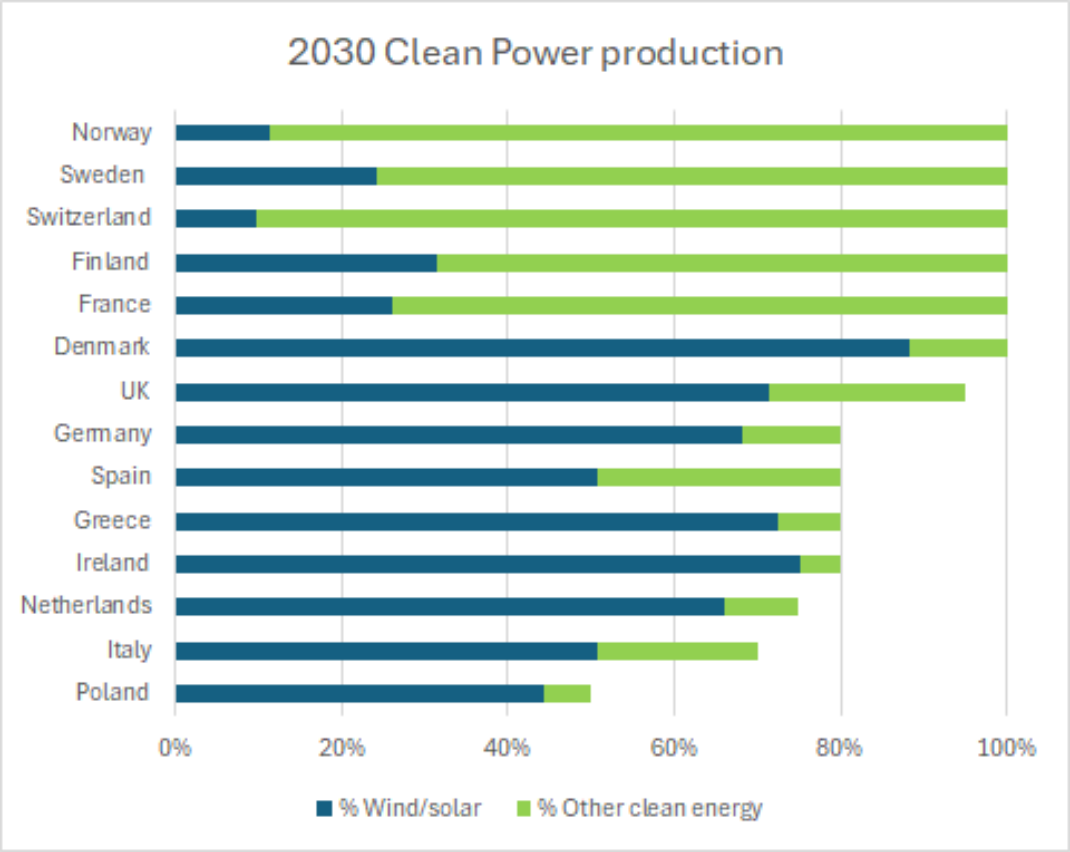
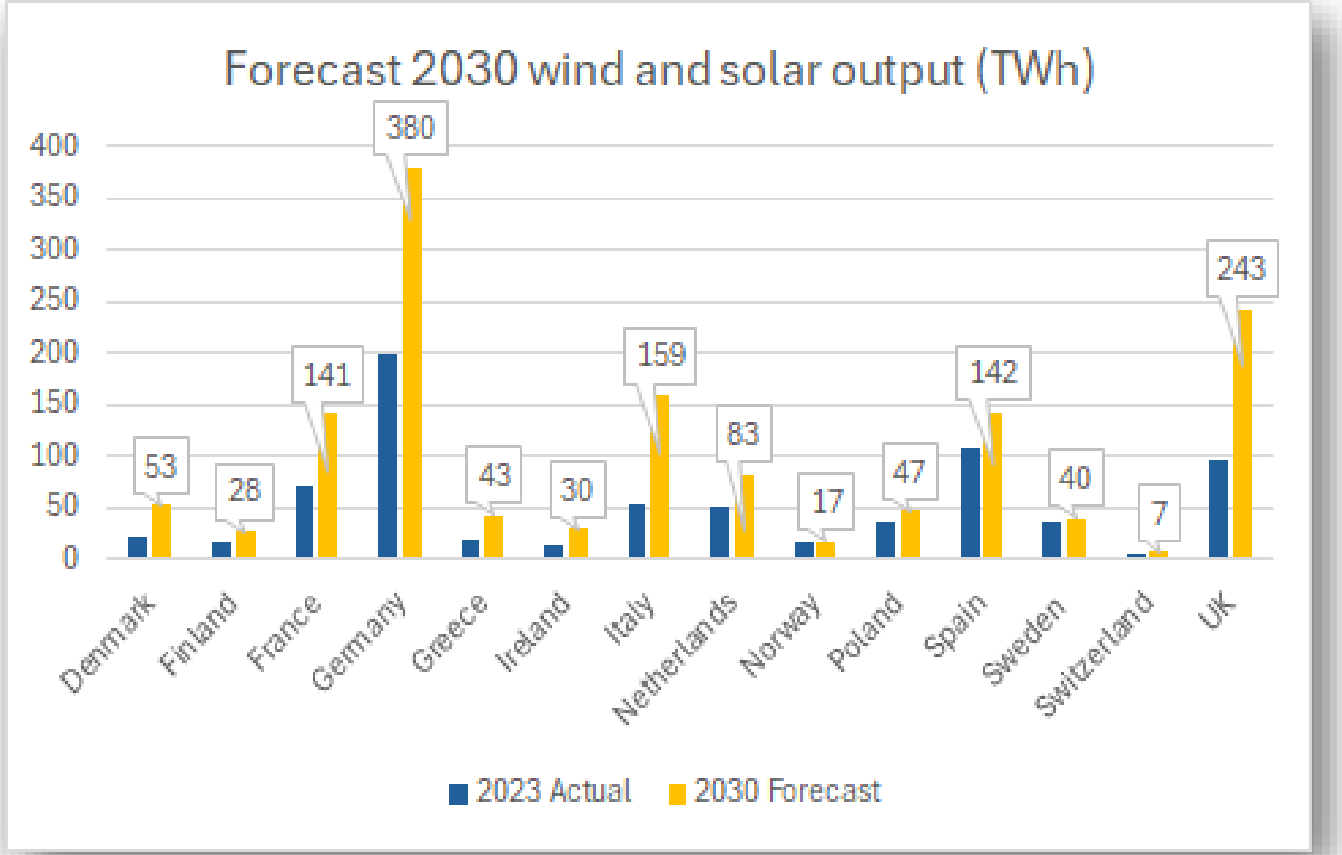
2030: Solar, wind and flexibility needs





Across the ETRI14, 50 % of electricity will need to supplied by solar and wind by 2030 – flexibility resources will need to grow as well , especially in countries without other flexible clean power

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Smart Grid Communications

As volume of distributed flexibility grows, the greater the need for resilient communication systems.

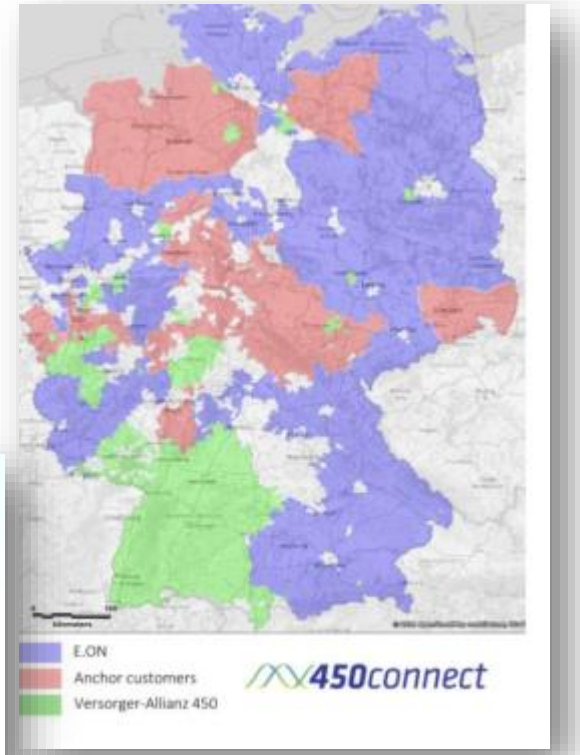
Many countries in Europe are adopting a private wireless-based communications approach using a long-term evolution (LTE) standard. (410 – 470 MHz spectrum dedicated for the purpose.).

More reliable than mobile networks and cost competitive to private fibre networks.

Dedicated or shared spectrum access has been awarded for smart grid capabilities in Denmark, Finland, Germany and Norway.

Enhanced private wireless approach has been trialled in eh UK but no yet fully adopted.

Case Study: Germany agreed a common industry model for constructions and operation of a nationwide 450 MHz radio network.



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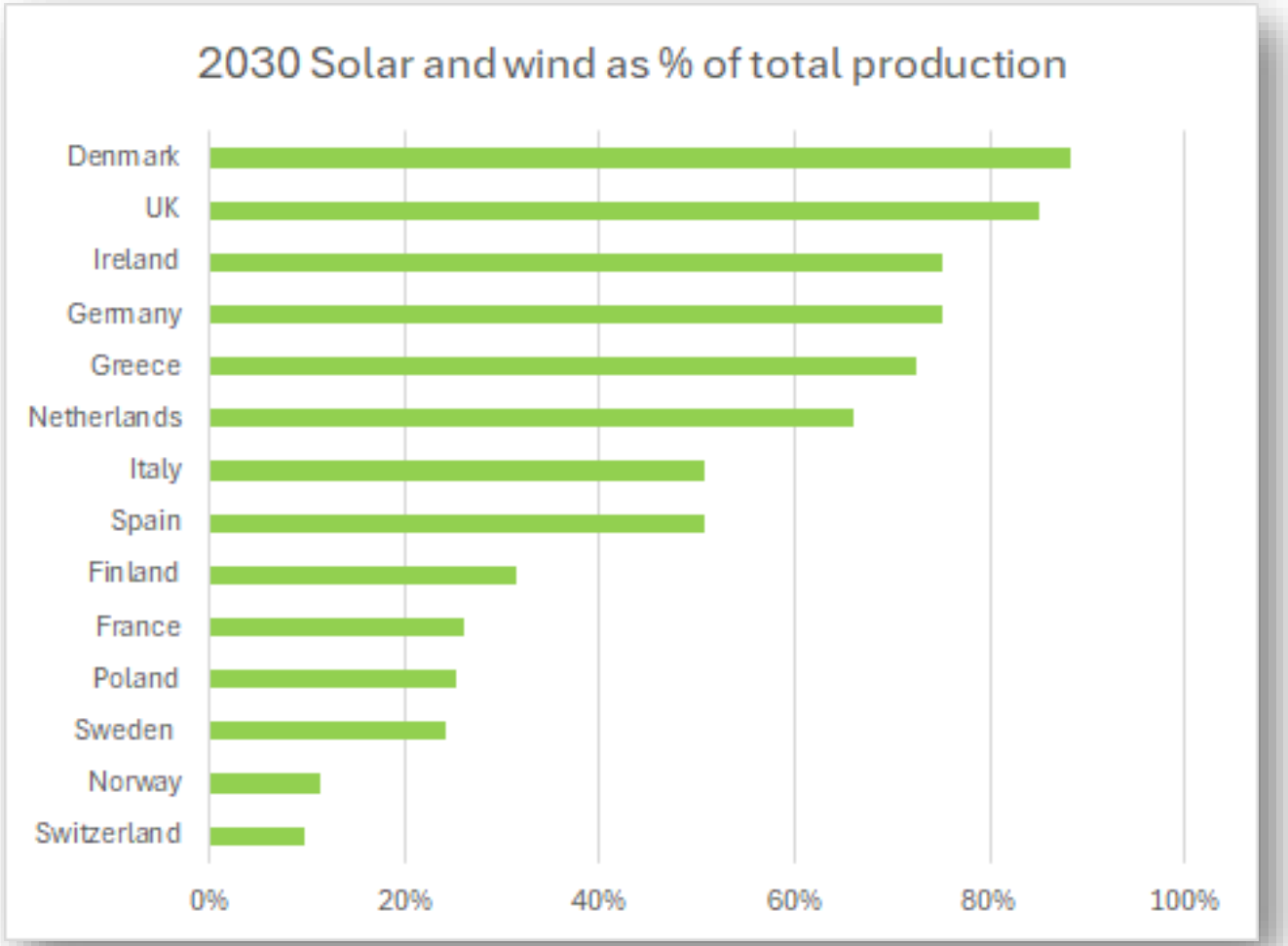
Addressing the 2030 flexibility challenge

Recommendations:

- Set 2030 targets for low carbon flexibility resources
- Introduce policies to incentivise investment in low carbon flexibility assets
- Open access to flexibility markets
- Address competition from fossil-fuel flexibility assets with sunk costs
- Address grid connection queues and lack of grid capacity
- Address planning restrictions and delays
- Provide enabling technologies e.g. data, communications, smart grids; address cybersecurity risks.



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REA- Upcoming Events

@reassociation

COP29
Baku
Azerbaijan
UN CLIMATE CHANGE CONFERENCE

3rd December 2024

10am-5pm

Burges Salmon LLP
London, EC4

DECENTRALISED ENERGY

Businesses Making Smart Energy Systems Work

Burges Salmon

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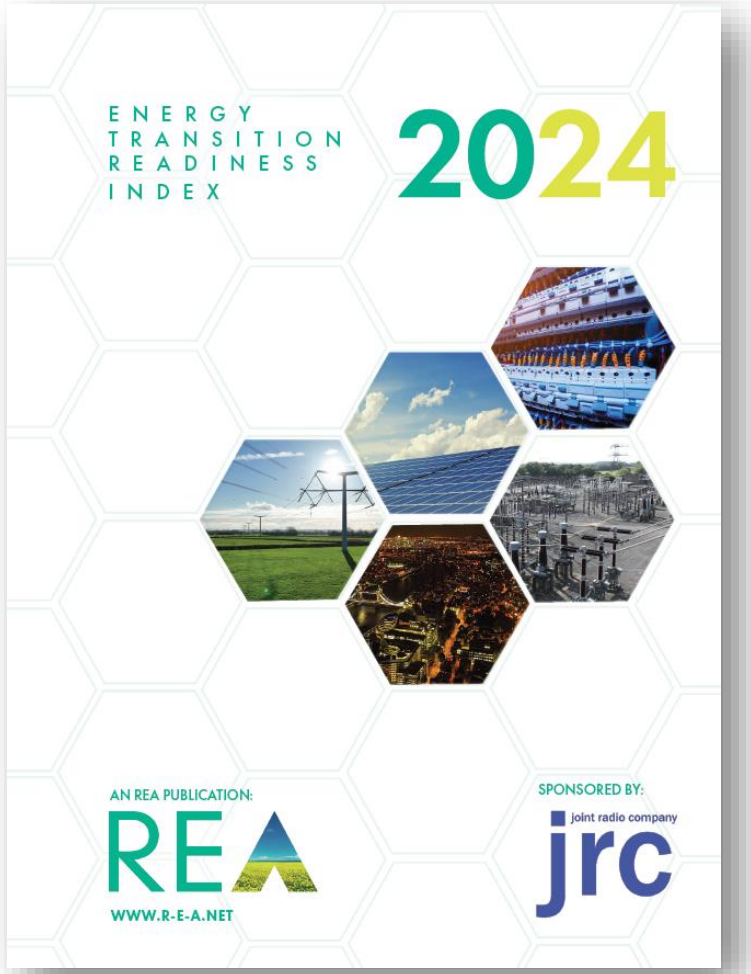
Download the Report



[Download the Report here]

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