

From transition to transformation in energy systems

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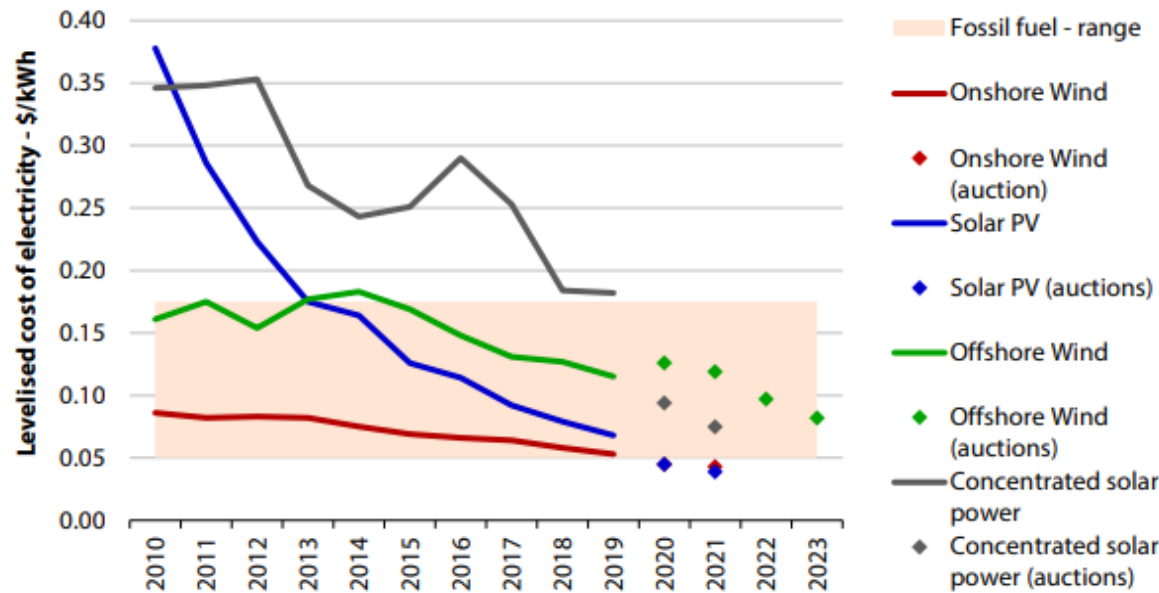


Towards a net zero future: Transforming our systems of
production & consumption

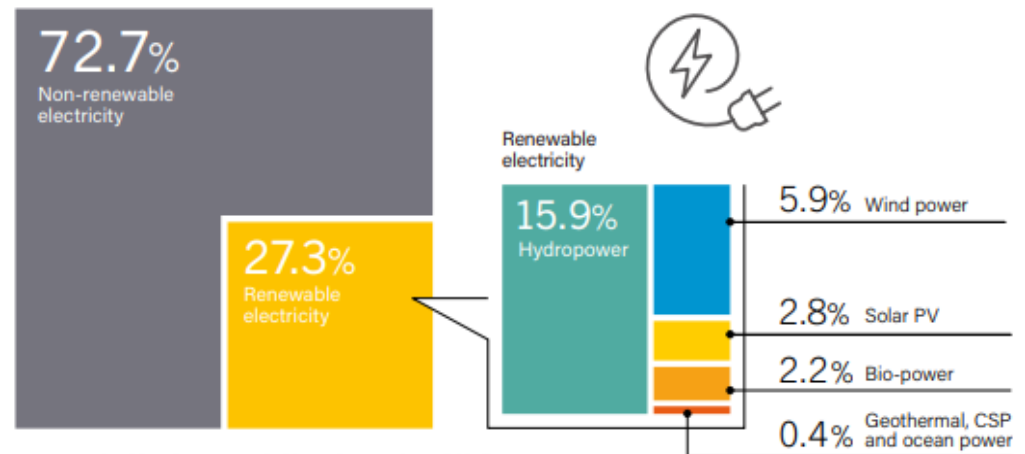
IES COP26 event, 30th March 2021

Renewable power generation

- Now mainstream – cost competitive in most countries
- Increases in renewable generation capacity outpacing fossil fuel and nuclear combined
- But still a long way to go...



Estimated Renewable Energy Share of Global Electricity Production, End-2019



Note: Data should not be compared with previous versions of this figure due to revisions in data and methodology.

Renewable power generation

Right now, **bake!**

We recommend baking when more than a third of Britain's electricity is coming from wind, solar and hydro power – right now, between 13:30 - 14:00, it's 58% *

Follow the [forecast on Twitter](#) or ask - [Alexa, should I bake?](#)

* the UK average in 2019 was 33.0%

The baking forecast

Here's the baking forecast for 29th - 2nd April

Show only the good times to bake

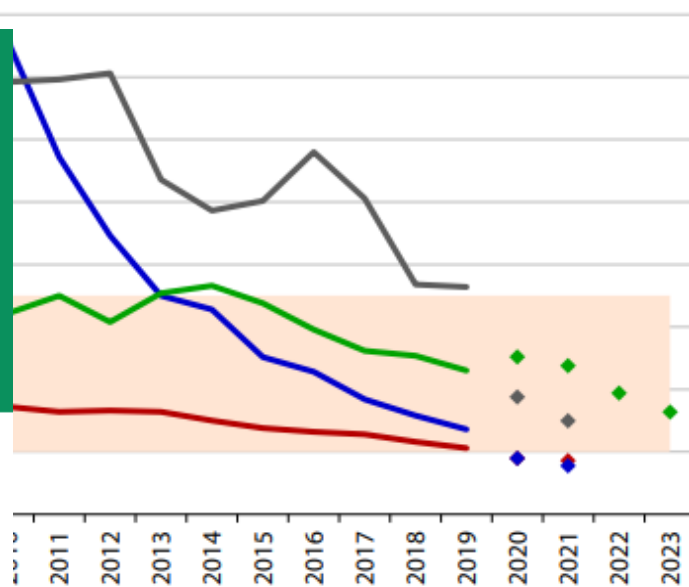
Today

Afternoon



<https://shouldibake.com/> and <https://gridwatch.co.uk/>

0.40

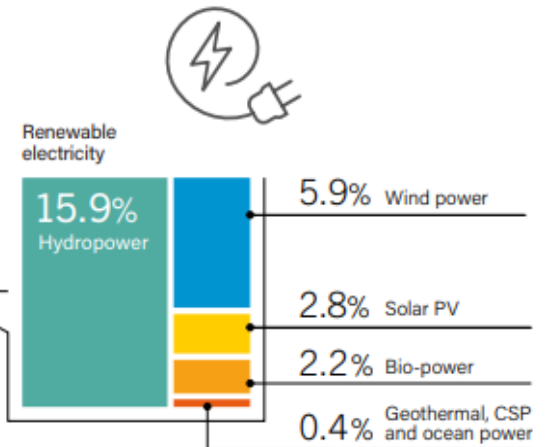


- Fossil fuel - range
- Onshore Wind
- ◆ Onshore Wind (auction)
- Solar PV
- ◆ Solar PV (auctions)
- Offshore Wind
- ◆ Offshore Wind (auctions)
- Concentrated solar power
- ◆ Concentrated solar power (auctions)

Projected Renewable Energy Share of Global Electricity Production, End-2019

2.7%
Renewable
electricity

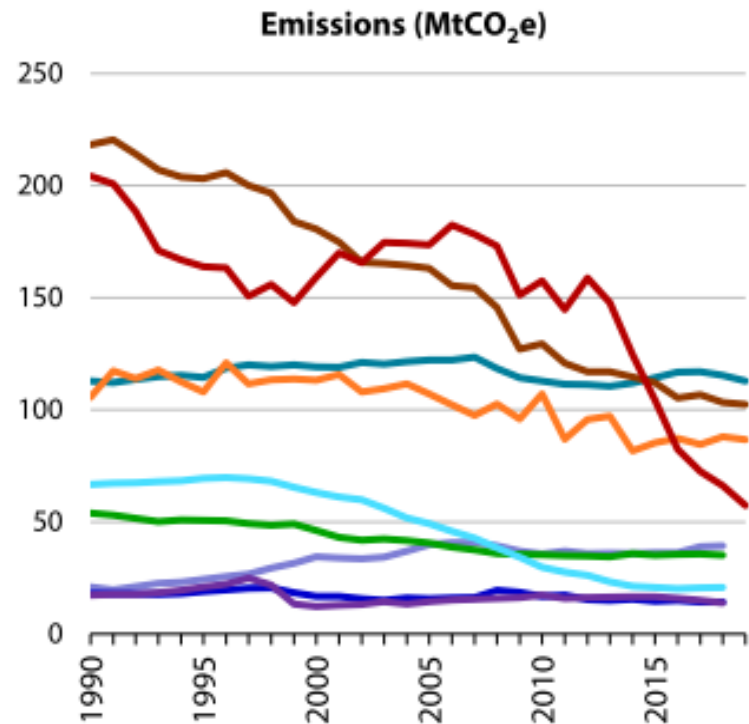
27.3%
Renewable
electricity



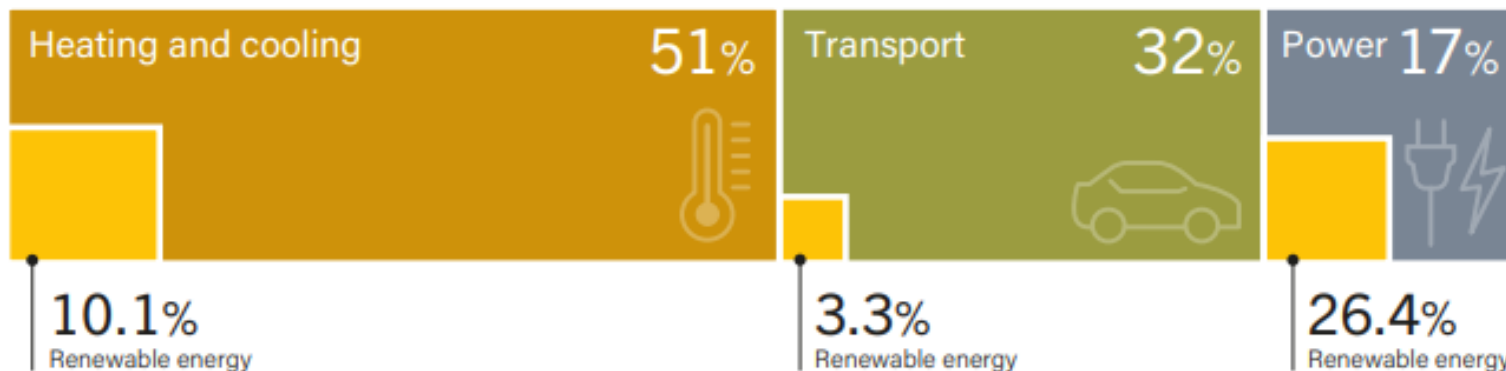
Note: Data should not be compared with previous versions of this figure due to revisions in data and methodology.

Shifting challenges

- Challenge now about integration across power, heat and transport
- These changes are far more transformative and are likely to require more varied and localised approaches



Renewable Share of Total Final Energy Consumption, by Final Energy Use, 2017



Power = red
 Industry = brown
 Buildings = orange
 Transport = blue

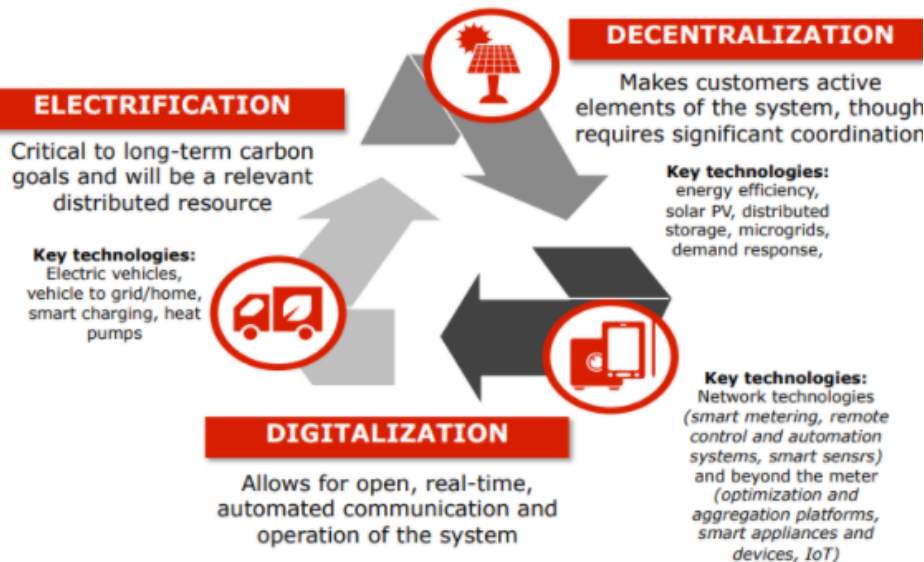
Note: Data should not be compared with previous years because of revisions due to improved or adjusted methodology.

Source: Based on IEA data.

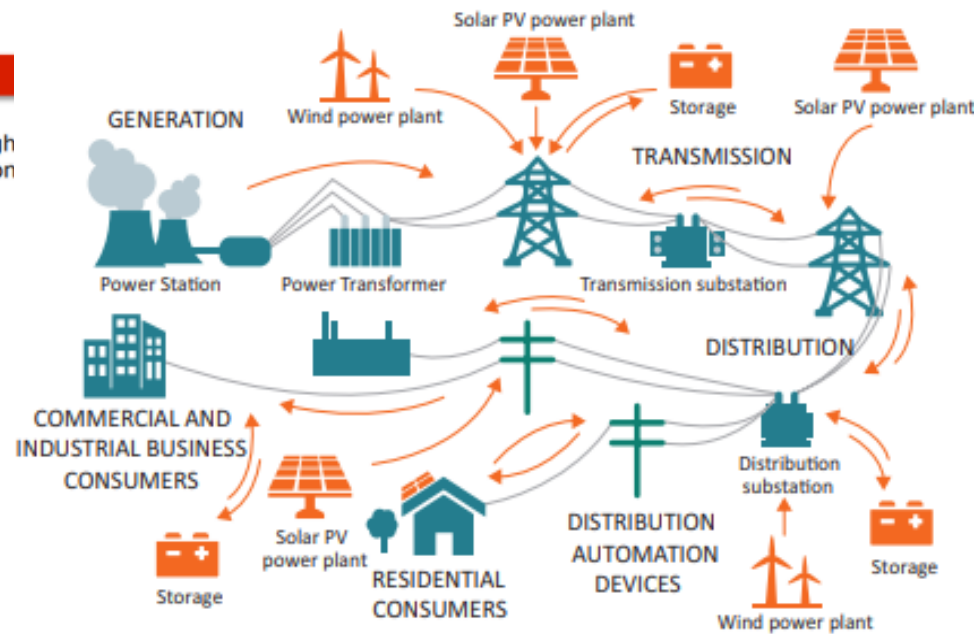
<https://www.theccc.org.uk/publication/reducing-uk-emissions-2020-progress-report-to-parliament/>
https://www.ren21.net/wp-content/uploads/2019/05/gsr_2020_key_findings_en.pdf

Smart, flexible energy systems

- Centrality of electrification - heat pumps, heat networks, hydrogen (?), electric vehicles
- Importance of smart flexibility – storage, demand side response
- From business model experimentation to regulatory structures and local planning



FUTURE POWER SYSTEM



http://www3.weforum.org/docs/WEF_Future_of_Electricity_2017.pdf

Source: NIC, 2016

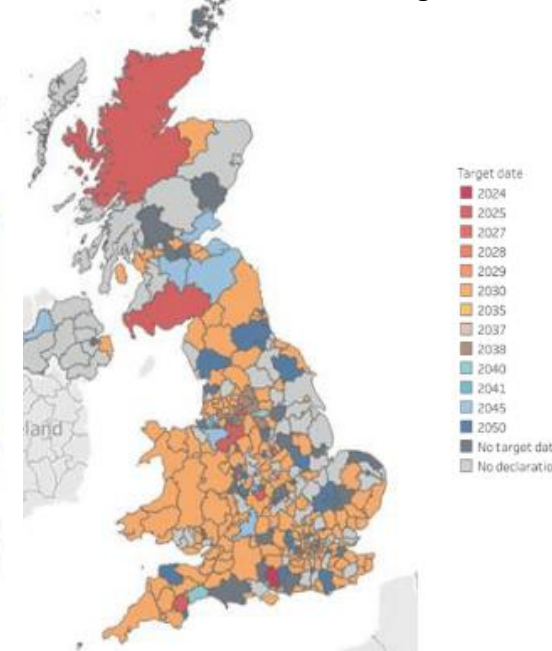
Evolving policy approaches for more localised systems

- Climate Emergency Declarations & participatory approaches
- Increasing local experimentation and political engagement
- Engaged consumers **and** communities?
- Emerging role for local and regional transformation planning: infrastructure, jobs, equity, managing deployment risks



Figure 1.1 Local Authority climate emergency declarations

Committee on Climate Change, 2020



the four key elements of local area energy planning



CSE and ESC, 2020

<https://www.futurelearn.com/courses/transforming-energy-systems>