
YDCW
CPRW
Elusen Cefn Gwlad Cymru
The Welsh Countryside Charity

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CPRW Trustee

Future Energy Scenarios in Wales

July 2024

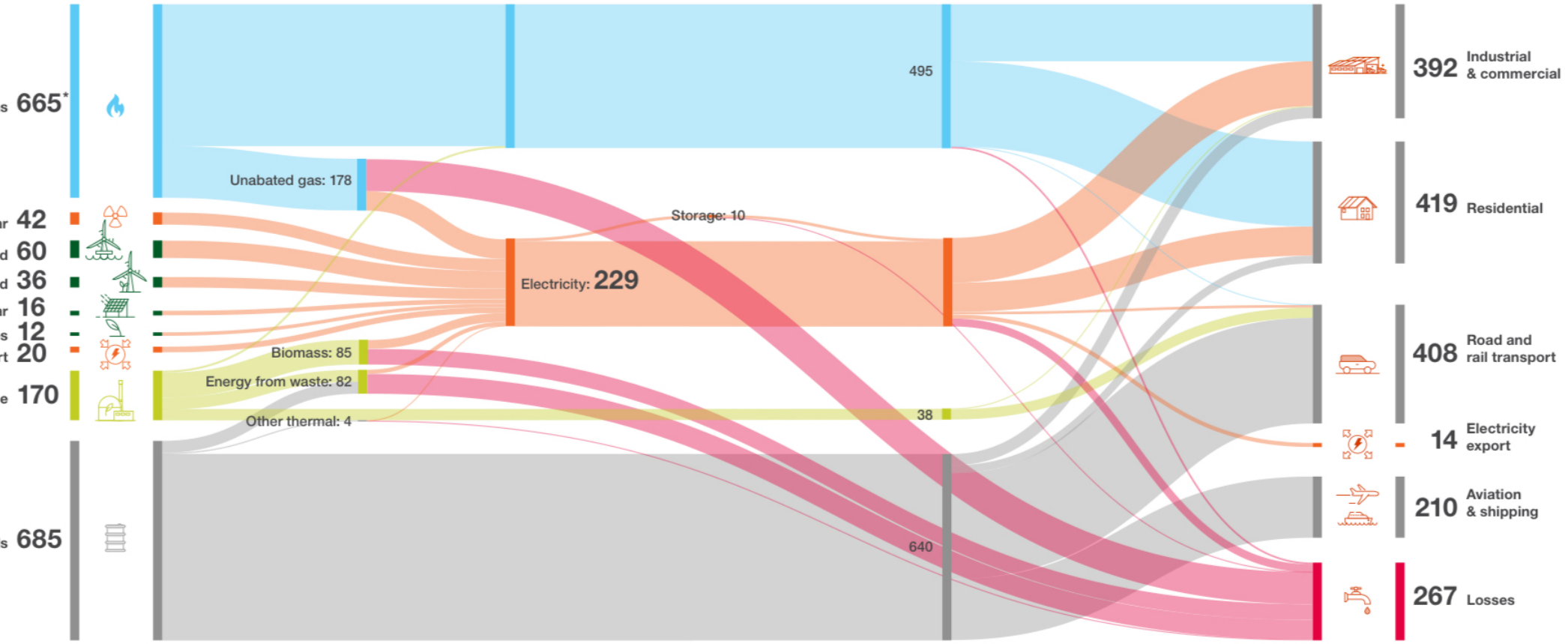
Future Energy Scenarios:

ESO Pathways to Net Zero

ESO

tween different fuels are low, demonstrating limited whole system thinking or cross-sector decarbonisation.
ke up 79% of total energy supply. Petroleum supplies over 90% of road transport demand and 100% of
ipping demand.

Total energy supply
1706 TWh



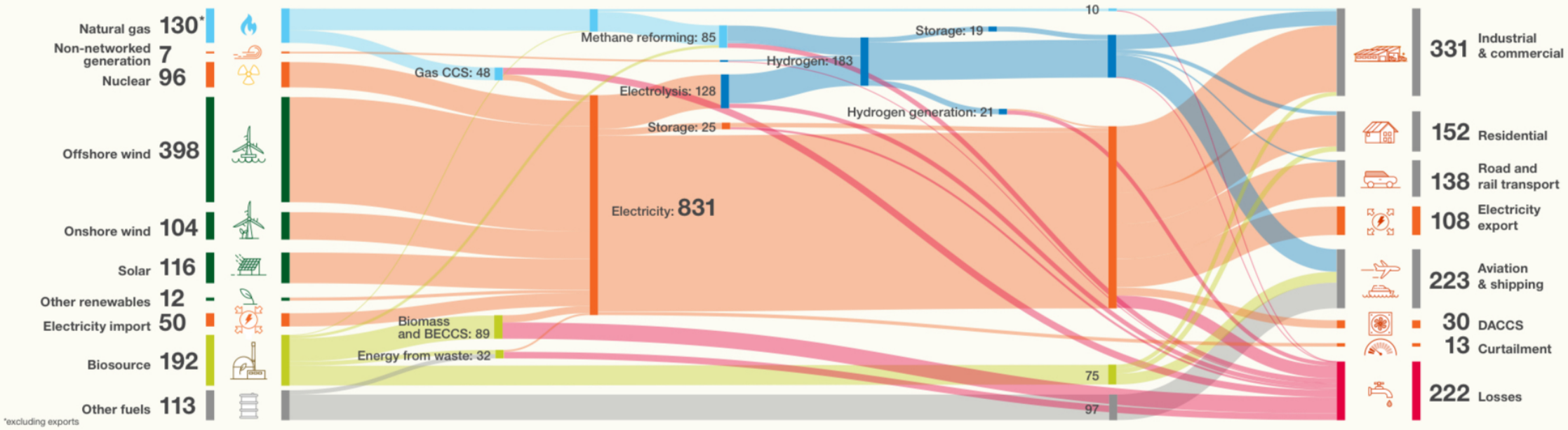
Please note that TWh figures are rounded to the nearest number.

Energy supply and demand in 2050

Holistic Transition

Reliance on fossil fuels has significantly reduced, with nearly all the remaining gas used for power and hydrogen production being abated through carbon capture and storage (CCS). Overall energy demand falls by 488 TWh from 2023 driven by efficiency improvements and electrification. Electricity and hydrogen work together to supply 60% and 19% of the 2050 energy demand respectively.

Total energy supply
1218 TWh



Please note that TWh figures are rounded to the nearest number.

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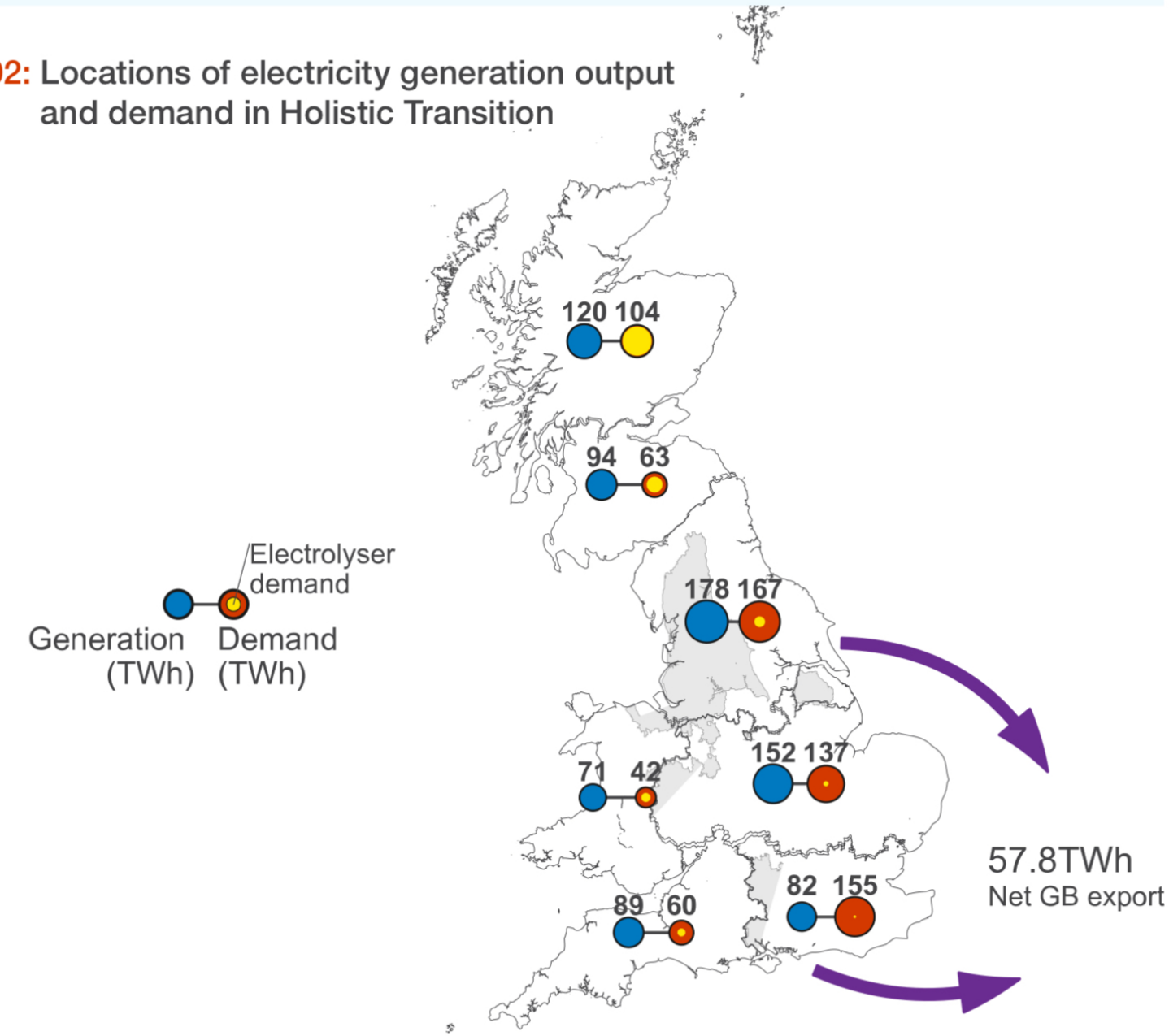
Figure ES.02: Locations of electricity generation output and demand in Holistic Transition



Regional spotlight: Transforming GB electricity networks

GB electricity networks will need to continue to rapidly transform over the coming decades, as the system transitions away from the large, centralised fossil fuel fired generation of the past to more decentralised, low carbon sources in the future.

Figure ES.E.04: Offshore wind capacity by region (GW) Consumer Transformation

Scotland

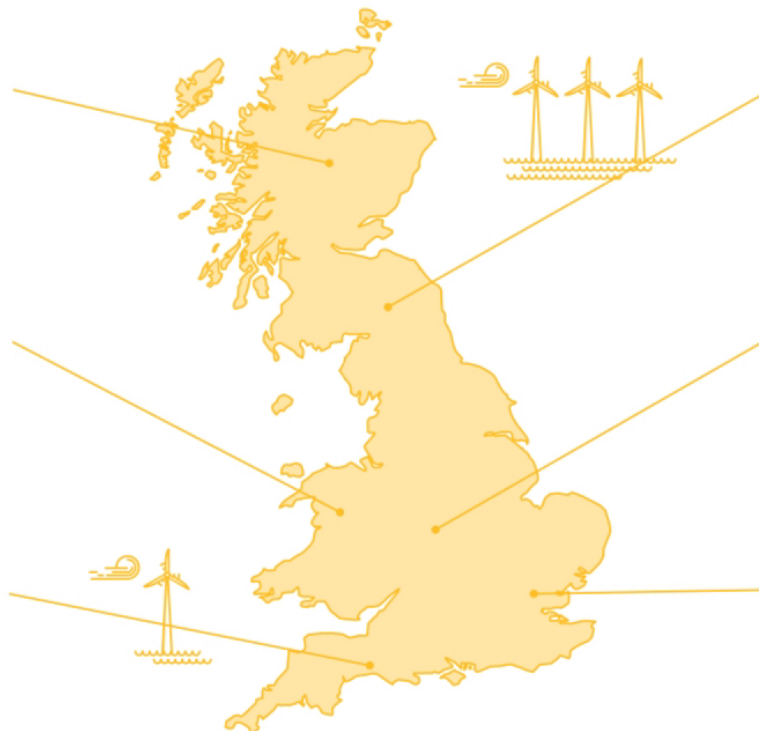
	2021	2030	2050
Offshore Wind Capacity	2	10	38
Solar PV Capacity	1	2	7
Onshore Wind Capacity	9	21	28

Wales

	2021	2030	2050
Offshore Wind Capacity	1	7	16
Solar PV Capacity	1	3	6
Onshore Wind Capacity	1	2	5

South West

	2021	2030	2050
Offshore Wind Capacity	0	0	4
Solar PV Capacity	3	6	15
Onshore Wind Capacity	0	1	2



North England

	2021	2030	2050
Offshore Wind Capacity	6	14	27
Solar PV Capacity	3	7	18
Onshore Wind Capacity	2	3	8

Midlands

	2021	2030	2050
Offshore Wind Capacity	3	11	14
Solar PV Capacity	3	7	17
Onshore Wind Capacity	0	1	2

South East

	2021	2030	2050
Offshore Wind Capacity	2	2	10
Solar PV Capacity	3	7	17
Onshore Wind Capacity	1	1	3

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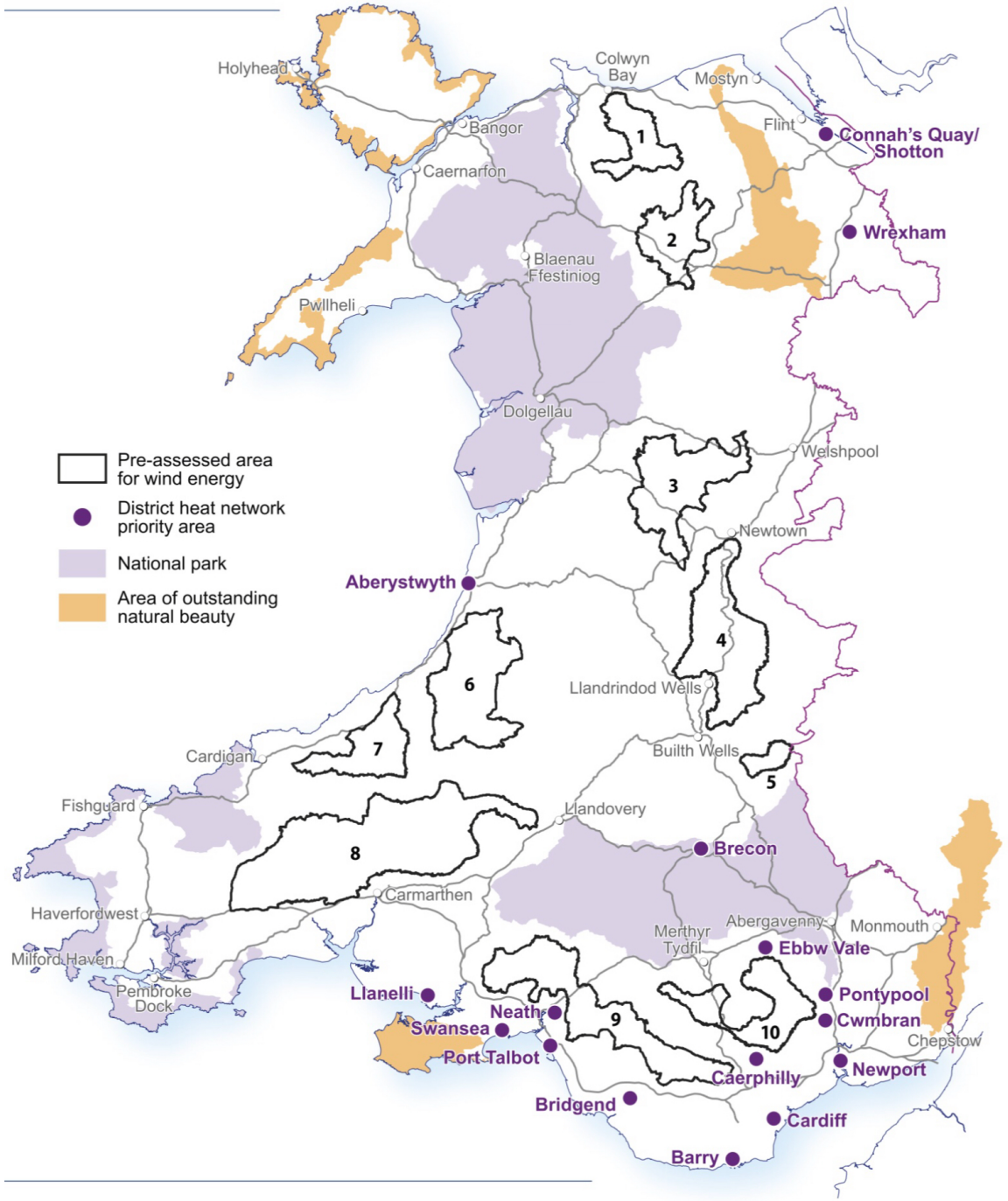
Wales

	2021	2030	2050
Offshore Wind Capacity	1	7	16
Solar PV Capacity	1	3	6
Onshore Wind Capacity	1	2	5


Pre-assessed area for wind energy
District heat network priority area
National park
Area of outstanding natural beauty
Holyhead
Bangor
Caernarfon
Colwyn Bay
Mostyn
Flint
Connah's Quay/ Shotton
Wrexham
Blaenau Ffestiniog
Pwllheli
Dolgellau
Welshpool
Newtown
Aberystwyth
Llandrindod Wells
Builth Wells
Cardigan
Fishguard
Llandovery
Brecon
Carmarthen
Haverfordwest
Milford Haven
Pembroke Dock
Merthyr Tydfil
Abergavenny
Monmouth
Ebbw Vale
Pontypool
Cwmbran
Chepstow
Llanelli
Neath
Swansea
Port Talbot
Caerphilly
Newport
Bridgend
Cardiff
Barry
1
2
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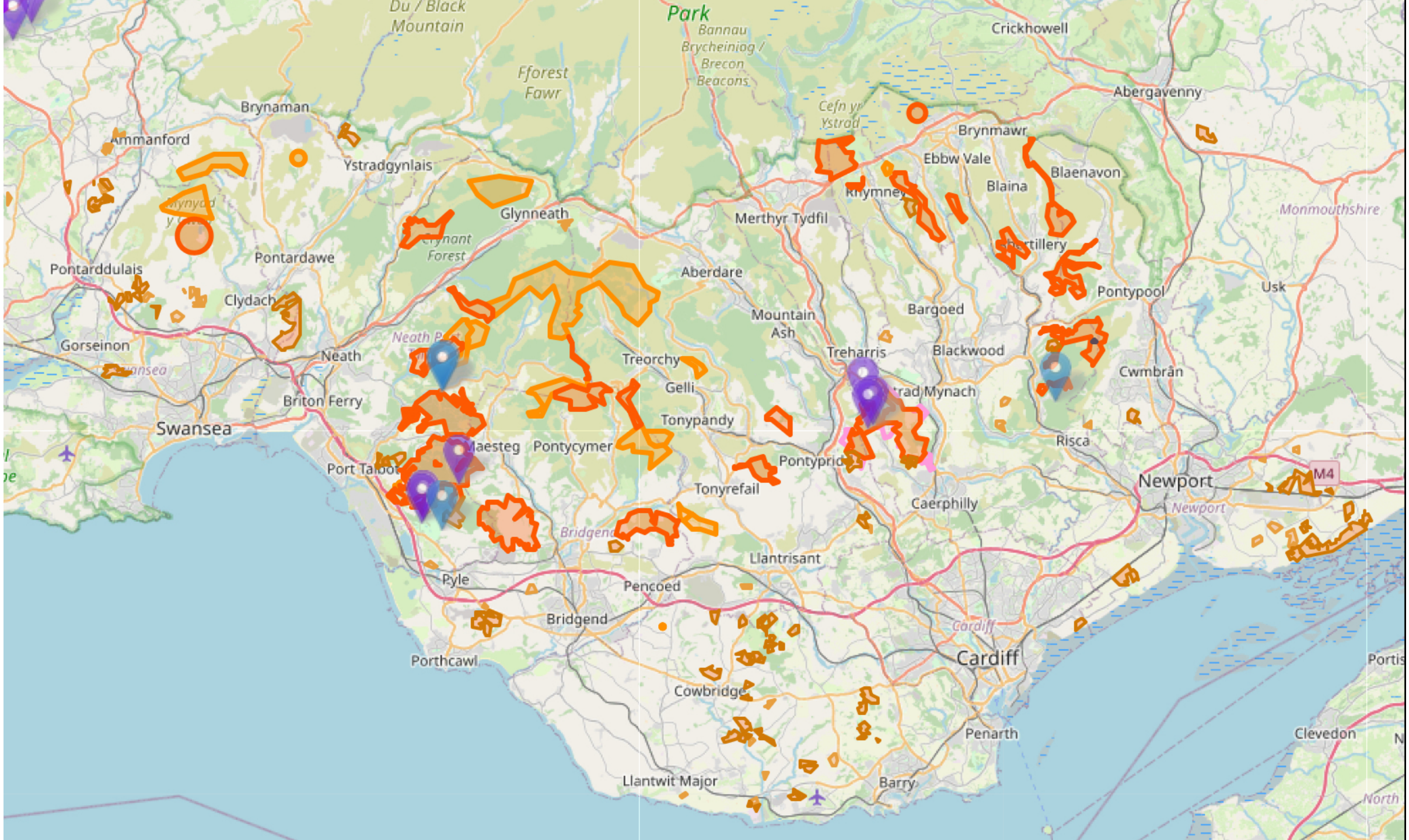
Brecon
Carmarthen
Abergavenny
Monmouth
Merthyr
Tydfil
Ebbw Vale
Llanelli
Pontypool
Neath
9
10
Cwmbran
Swansea
Chepstow
Port Talbot
Newport
Caerphilly
Bridgend
Cardiff
Barry


Du / Black Mountain
Park
Bannau Brycheiniog / Brecon Beacons
Fforest Fawr
Crickhowell
Abergavenny
Brynaman
Ammanford
Ystradgynlais
Cefn yr Ystrad
Brynmawr
Ebbw Vale
Blaenavon
Blaina
Rhymney
Glynneath
Merthyr Tydfil
Monmouthshire
Pontardawe
Pontardulais
Aberdare
Pontypool
Usk
Clydach
Bargoed
Mountain Ash
Gorseinon
Neath
Treorchy
Treharris
Blackwood
Cwmbrân
Gelli
Briton Ferry
Tonypandy
Swansea
Risca
Maesteg
Pontycymer
Pontypridd
Port Talbot
Newport
M4
Tonyrefail
Caerphilly
Bridgend
Llantrisant
Pyle
Pencoed
Bridgend
Cardiff
Porthcawl
Cowbridge
Penarth
Clevedon
Llantwit Major
Barry

Clean Power 2030

Advice on achieving clean power for Great Britain by 2030

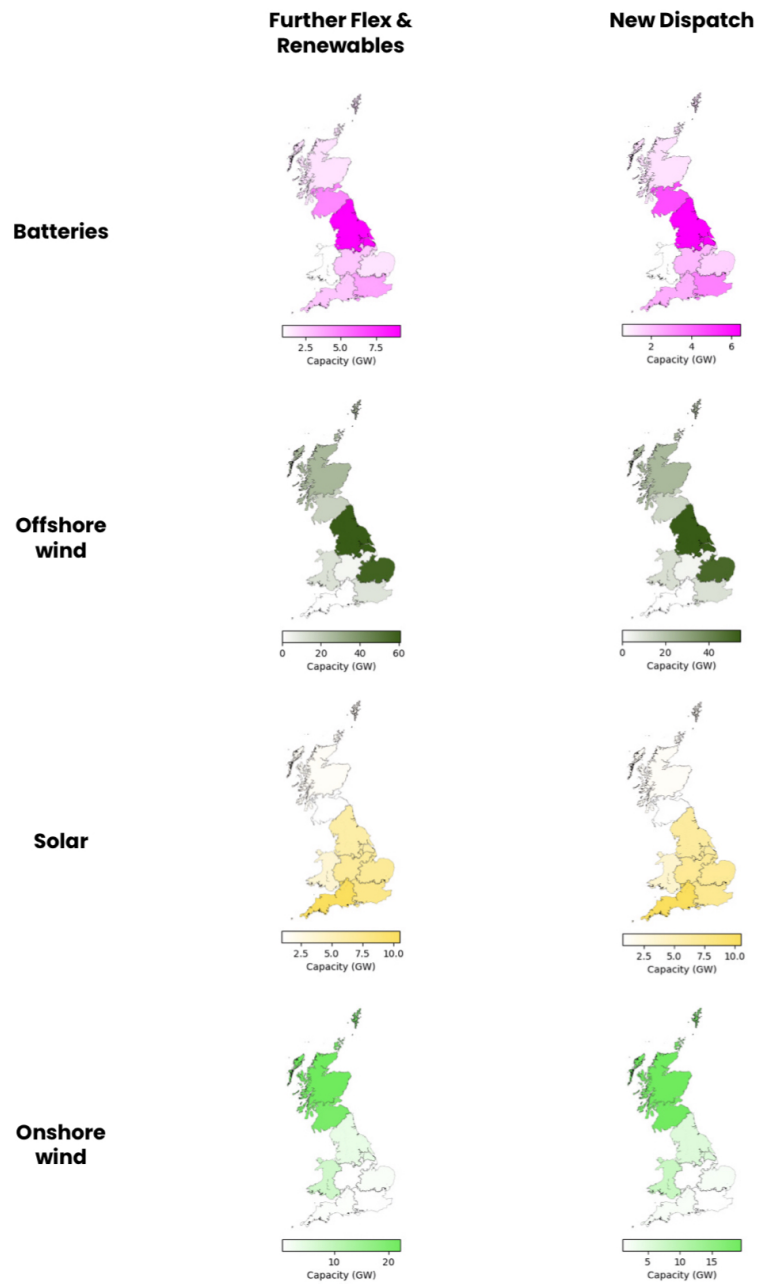


Figure 14: Spatial capacity maps

Solar

Onshore wind

Figure 14: Spatial capacity maps

UK Government

Clean Power 2030 Action Plan: A new era of clean electricity

Connections reform annex

Transmission connected technologies

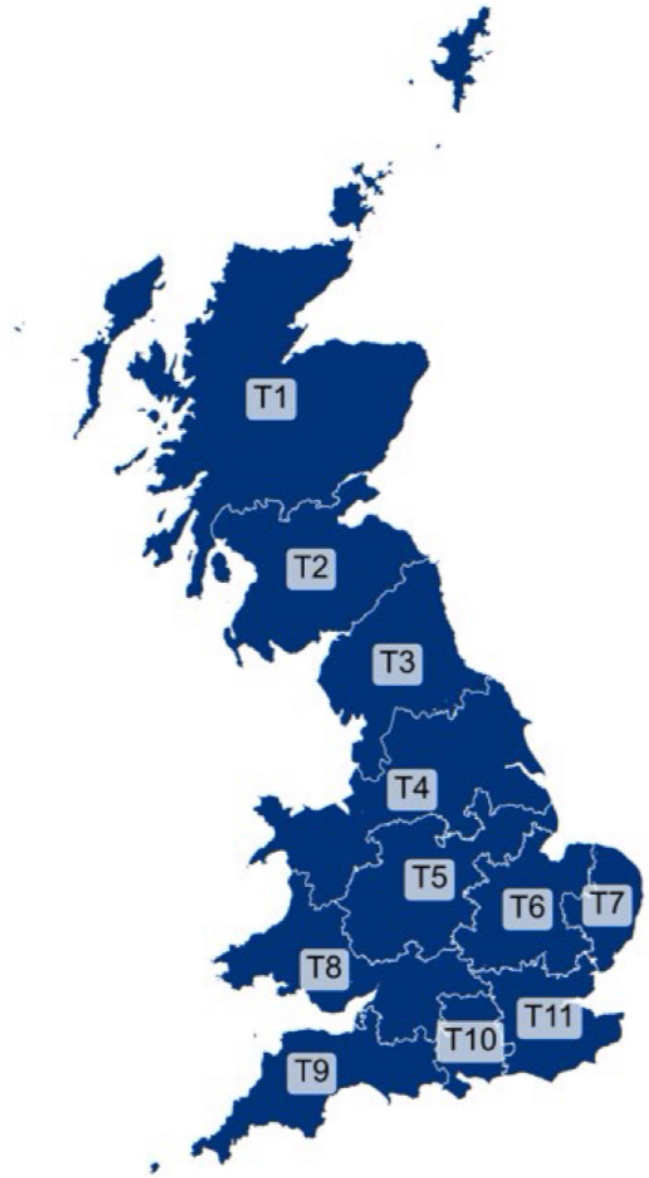
Table 2: Regional capacity breakdowns for transmission connected technologies required for 2030[20] and 2035[21]

Transmission network region	Solar (MW) 2030	Solar (MW) 2035	Onshore wind (MW)[22] 2030[23]	Onshore wind (MW) 2035	Batteries (MW)[24] 2030	Batteries (MW) 2035
N. Scotland	100	800	5,500	-	1,900	1,900
S. Scotland	600	800	8,800	-	3,900	3,900
N. England	500	1,400	-	-	800	800
N. Wales, the Mersey and the Humber	1,200	1,700	300	-	4,200	4,200
Midlands	4,000	5,200	-	-	1,300	1,300
Central England	2,100	3,300	-	-	500	500
E. Anglia	100	900	-	-	200	200
S. Wales and the Severn	1,100	1,300	1,300	-	900	900
S.W. England	300	300	-	-	400	400
S. England	200	200	-	-	100	100
South East England	600	1,100	-	-	1,700	1,700
GB total	**10,800**	**17,000**	**15,900**	**-**	**15,900**	**15,900**

Note: MW capacity figures have been rounded to the nearest 100 MW.

Table 3: Mapping of transmission network region codes to transmission region names

Transmission network region code	Transmission network region name
T1	N. Scotland
T2	S. Scotland
T3	N. England
T4	N. Wales, the Mersey & the Humber
T5	Midlands
T6	Central England
T7	E. Anglia
T8	S. Wales & the Severn
T9	S.W. England
T10	S. England
T11	South-East England



Distribution connected technologies

Table 4: Regional capacity breakdowns for distribution connected technologies required for 2030[25] and 2035[26]

Distribution network region	Solar (MW) 2030	Solar (MW) 2035	Onshore wind (MW)[27] 2030	Onshore wind (MW) 2035	Batteries (MW) 2030	Batteries (MW) 2035
Scottish and Southern Electricity Networks (SSEN) – Scottish Hydo Electric Power Distribution (SHEPD)	1,100	1,700	3,500	-	900	900
SP Distribution (SPD)	1,100	1,800	2,700	-	800	900
Northern Powergrid (NPg)	4,400	6,500	1,900	-	1,900	2,100
Electricity North West (ENWL)	1,500	2,300	700	-	900	1,000
SP Manweb	1,500	2,200	1,000	-	400	500
National Grid Electricity Distribution (NGED)	13,900	19,900	2,400	-	3,000	3,600
UK Power Networks (UKPN)	8,100	11,800	900	-	2,100	2,400
SSEN – Southern Electric Power Distribution (SEPD)	4,600	6,200	100	-	1,200	1,400
GB total	**36,200**	**52,400**	**13,200**	**-**	**11,200**	**12,800**

Note: MW capacity figures have been rounded to the nearest 100 MW.

Table 5: Mapping of distribution network region code to distribution region name

Distribution network region code	Transmission network region name
D1	SSEN - SHEPD
D2	SP Distribution
D3	ENWL
D4	NPg
D5	SP Manweb
D6	NGED
D7	SSEN - SEPD
D8	UKPN

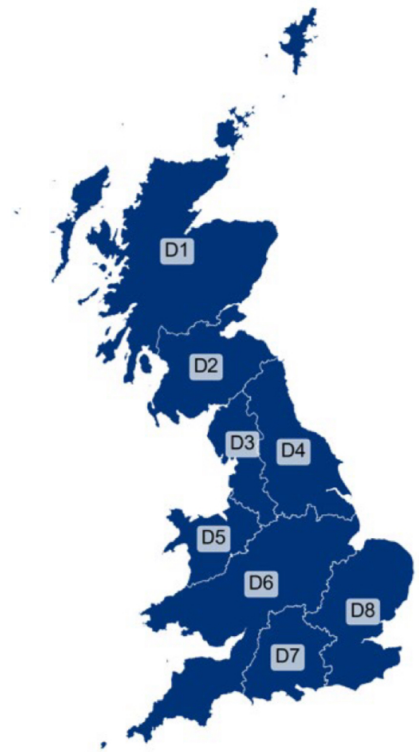
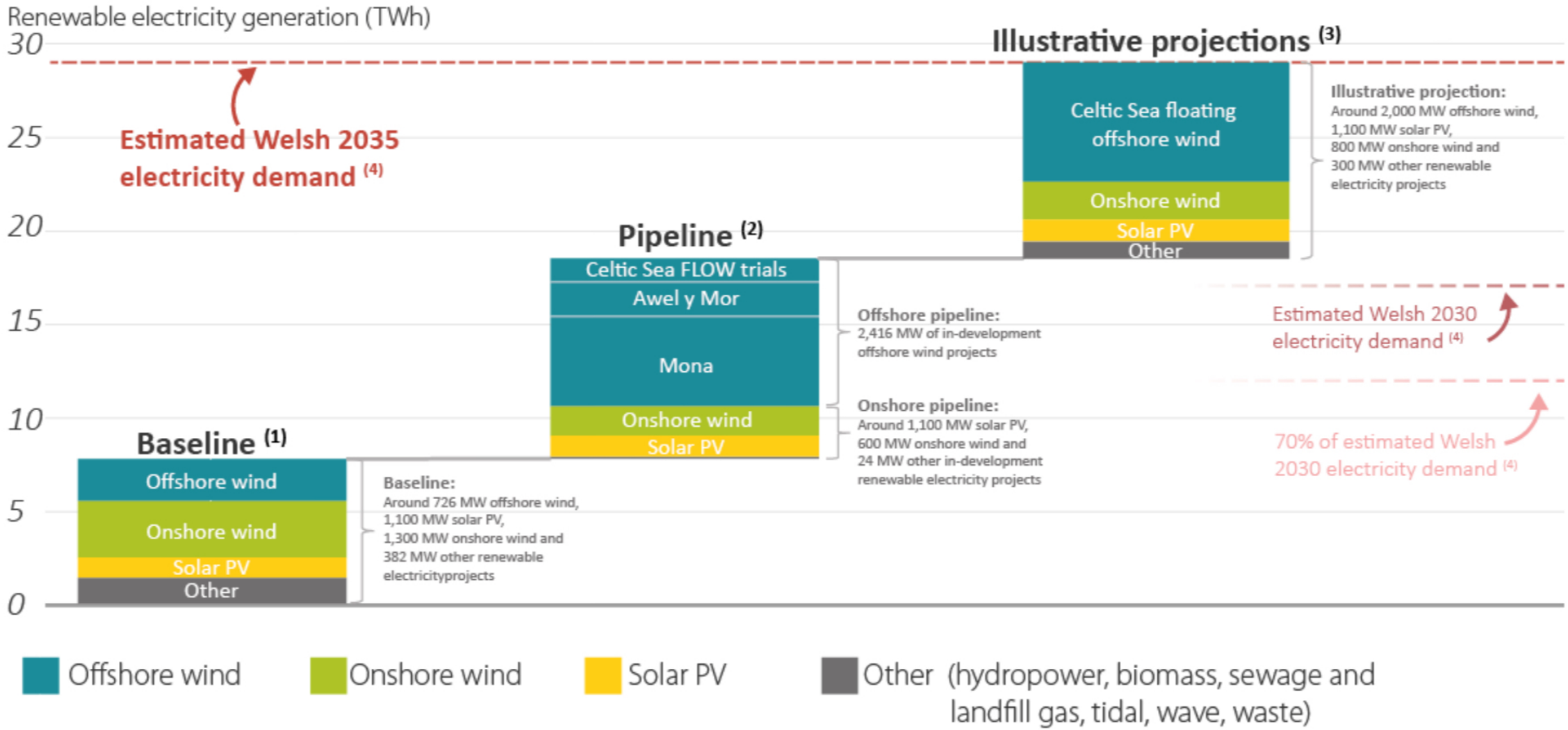


Table 6: Total capacities for Scotland, England and Wales by technology

GB region	Solar (MW) 2030	Solar (MW) 2035	Onshore wind (MW) 2030	Onshore wind (MW) 2035	Batteries (MW) 2030	Batteries (MW) 2035
Scotland	2,900	5,100	20,500	21,200	7,500	7,600
England and Wales	44,100	64,300	8,600	15,800	19,600	21,100
GB total	**47,000**	**69,400**	**29,100**	**37,000**	**27,100**	**28,700**

A route to 2035

Although Wales has the renewable energy resources to acheive more, the below is an illustrative route for Wales to generate the equivalent of 100% of its electricity demand from renewable electricity sources in 2035




Diolch | Thank you