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Distribution Future Energy Scenarios

Local Authority: Fenland District

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What are Distribution Future Energy Scenarios?

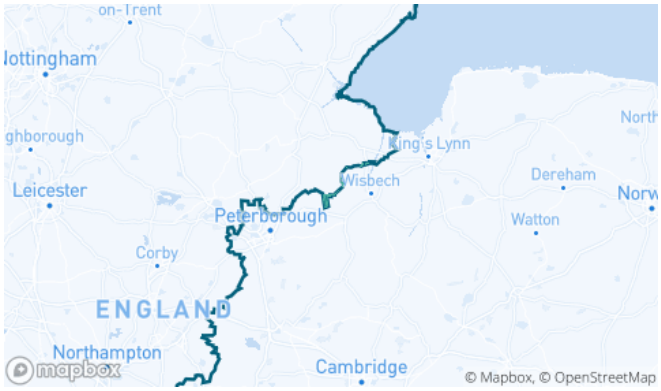
Western Power Distribution run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

The scenarios use a scenario framework consistent with all electricity distribution network operators and the National Grid ESO Future Energy Scenarios. These aim to account for differing uptakes of Electric Vehicles, Heat Pumps, new domestic and I&C developments and distributed generation connections, that WPD use to assess the strategic development of our network.

A summary of the methodology and detailed reports are available on our website. DFES scenario projections are available on the interactive DFES map on the website here.

Geographic Area Covered

This report covers the area of Fenland District covered by the WPD East Midlands licence area.



Scenario Summary

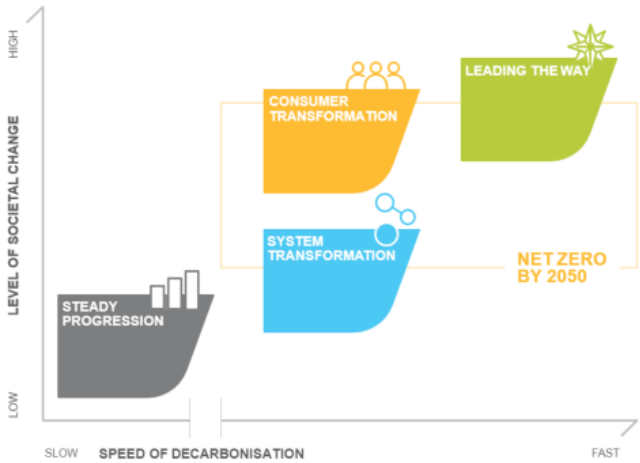
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

Steady Progression (SP) assumes non-compliance with the net zero emissions target. Low levels of decarbonisation and societal change.

System Transformation (ST) has high level of decarbonisation with lower societal change. Larger, more centralised solutions are developed. This scenario has the highest levels of hydrogen deployment.

Consumer Transformation (CT) has high levels of decarbonisation and societal change. Consumers adopt new technologies rapidly, and more decentralised solutions are developed. This scenario has significant electrification of domestic heat.

Leading the Way (LW) has very high levels of decarbonisation and societal change. Consumers adopt new technologies rapidly, and a mix of solutions are developed. This scenario aims for the "fastest credible" decarbonisation pathway.



Scenario Projections: at a glance

The DFES scenario projections at a Local Authority level include all customers connected to the distribution network within the area of the Local Authority at all voltage levels. Customers connected to the transmission network are not included in this analysis. The table below shows a breakdown of the total for Fenland District for two specific years in the DFES analysis.

WPD also create a 5th 'Best View' scenario for the purposes of regulatory reporting. This is a hybrid scenario built on local stakeholder engagement, which maps which of the four DFES scenarios aligns most closely with regional ambition and delivery capabilities. The WPD Best View informs the likely amount of investment on the network across a licence area, and is supplemented by uncertainty mechanisms which can flex to accommodate changes in regional growth projections.

For the DFES 2020 analysis, Fenland District has been assigned the Steady Progression scenario for the WPD Best View.

Technology	Units	Baseline Total	2030				2050			
			SP	ST	CT	LW	SP	ST	CT	LW
Air conditioning	Number of domestic air conditioning units	0	0	0	0	0	174	98	98	4
Direct electric heating	Number of customers with direct electric heating	0	0	0	0	0	28	10	6	12
Domestic	Number of new dwellings	0	0	0	0	0	90	280	280	242
Electric vehicles	Number of electric vehicles	28	396	472	864	924	2482	2017	1737	1517
EV Charge Point	Number of EV charge points	14	248	328	822	854	2171	2057	2067	2056
Heat pumps	Number of heat pumps	0	0	0	0	0	30	46	168	114
Non domestic	Floorspace (metres squared) of new I&C developments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Distributed Generation	MW (installed capacity)	0.0	0.2	1.5	1.5	1.5	3.2	4.7	4.8	4.9
Solar Generation	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.6	0.6
Storage	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Wind	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

What does this mean for the local distribution network?

As the DFES scenario projections do not imply any electrical behaviour to the base units, electrical profiles are assigned to each technology type for different yearly snapshots. The profiled demand and generation outputs can be overlaid onto a network model and used to identify where there may be future network constraints on the Extra High Voltage (EHV) networks. The customer behaviour assumptions are summarised in the DFES: Customer Behaviour Report., and the detailed network review forms a key input to the Network Development Plan due to be published in 2022.

Incorporating your feedback

WPD is committed to continually improving the DFES process. Future work in 2021 will deliver projected energy consumption figures for each Local Authority alongside the volume projections. To validate the DFES process, we would like to sense check our scenario projections against the ambitions of the relevant Local Authorities in our area. WPD Distribution Managers will be engaging with local stakeholders throughout 2021 and any feedback will be incorporated in the 2021 Distribution Future Energy Scenarios analysis.

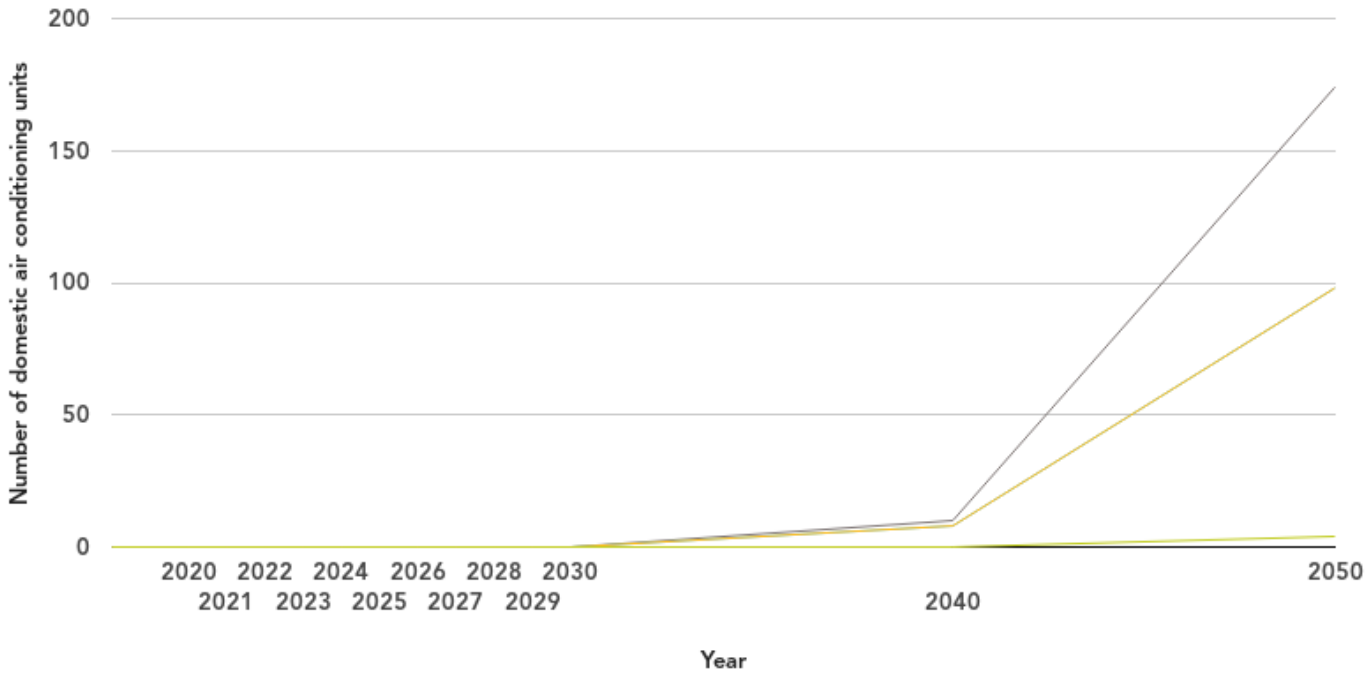
If you have any comments or queries regarding these reports, please contact wpdnetworkstrategy@westernpower.co.uk.

Technology Summary: Air conditioning

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0	0	0	0
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2040	10	8	8	0
2050	174	98	98	4

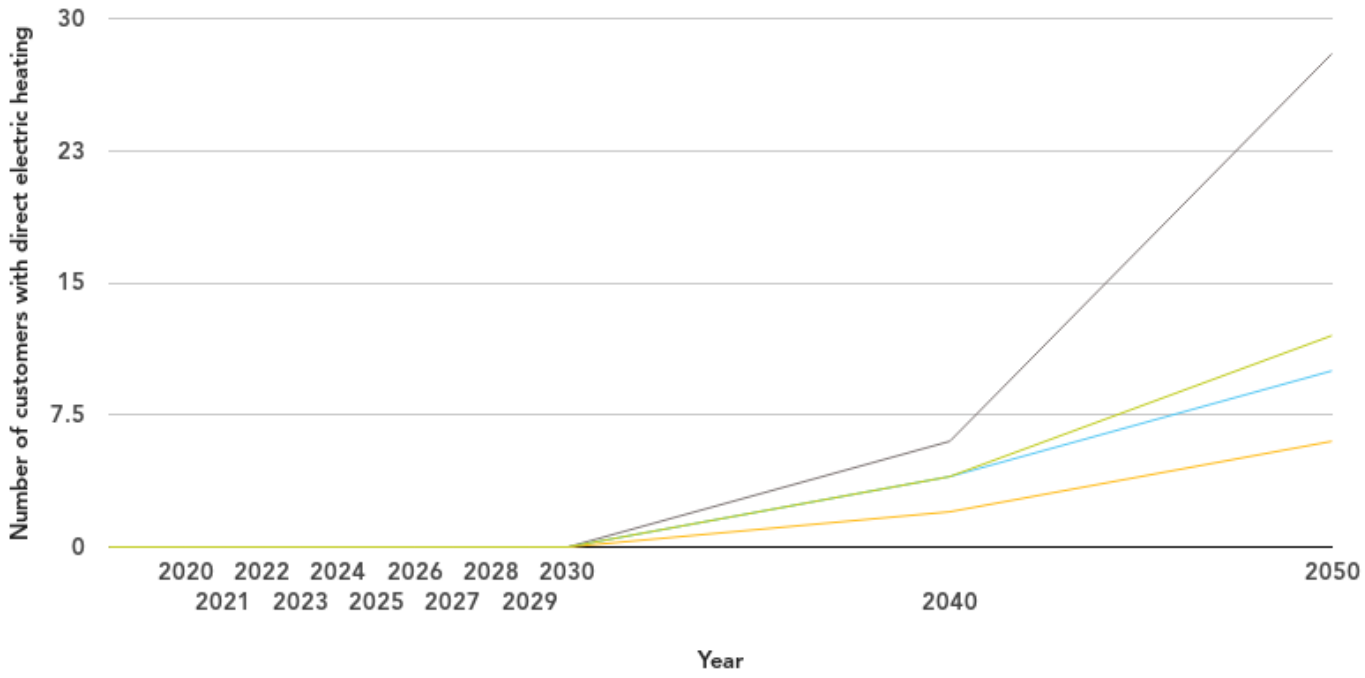


Technology Summary: Direct electric heating

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0	0	0	0
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2040	6	4	2	4
2050	28	10	6	12

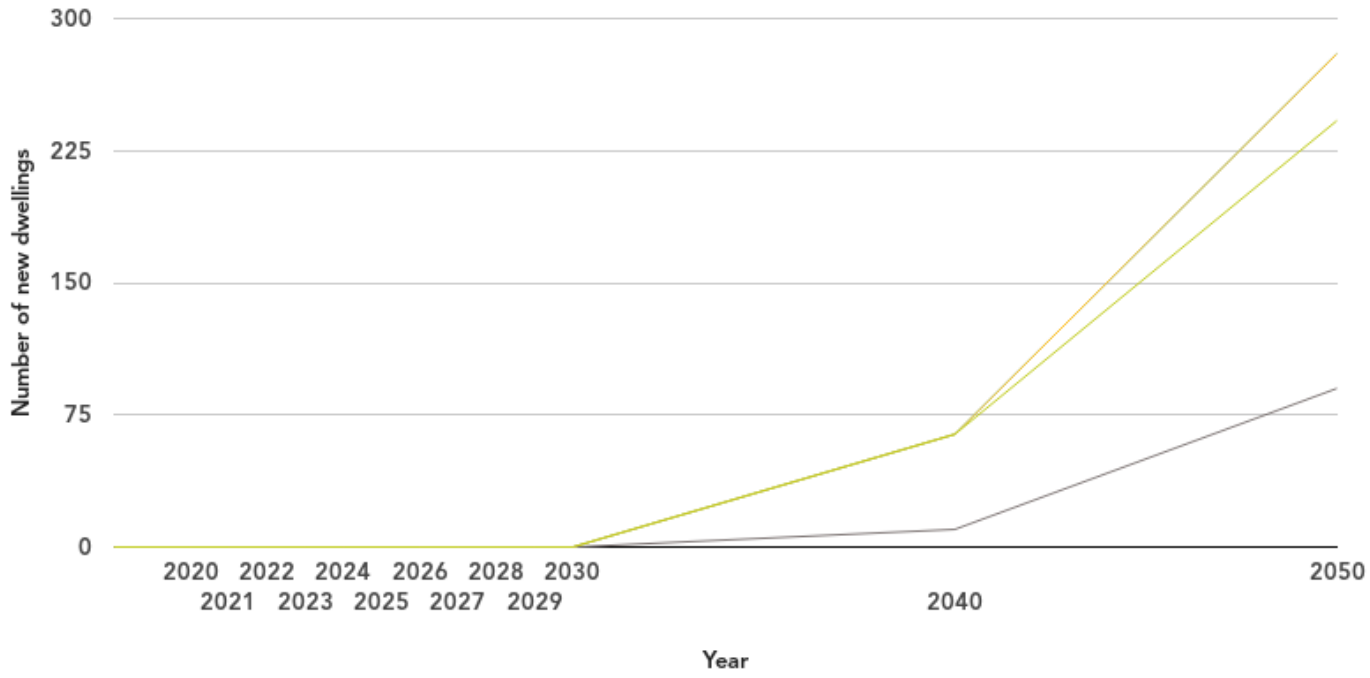


Technology Summary: Domestic

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0	0	0	0
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2040	10	64	64	64
2050	90	280	280	242

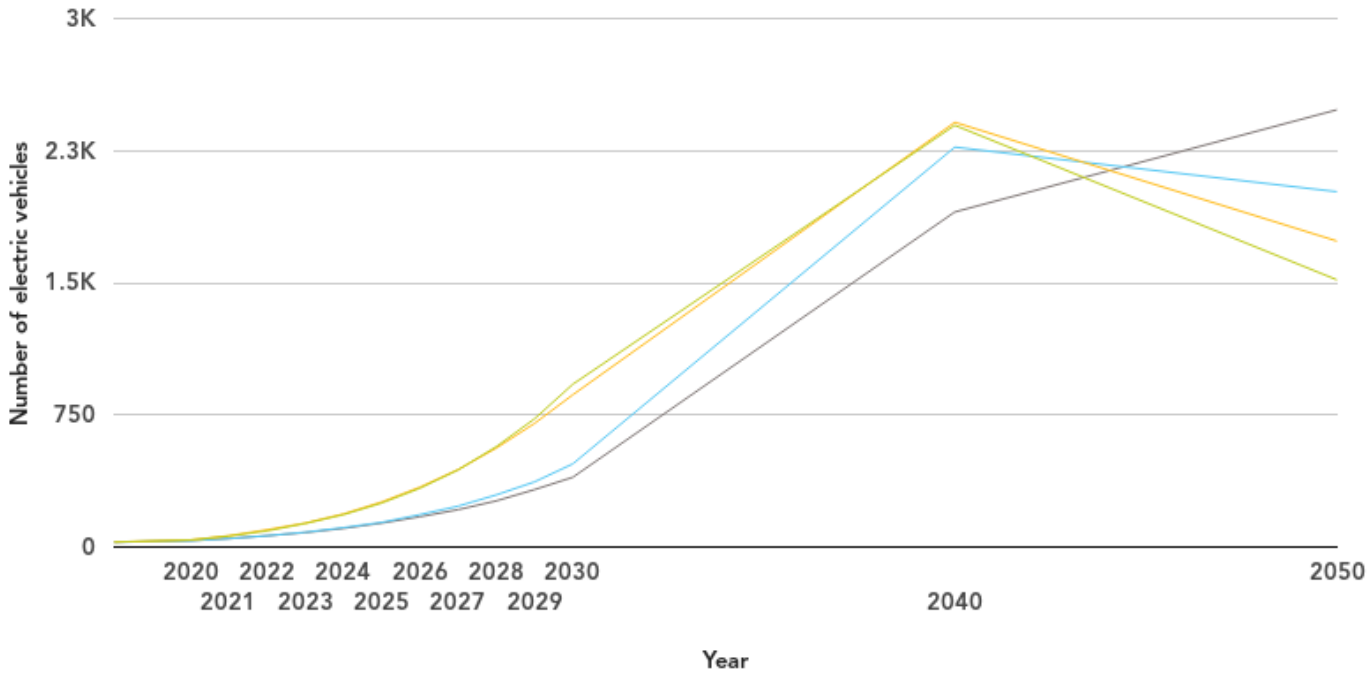


Technology Summary: Electric vehicles

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	28	28	28	28
2020	36	36	40	40
2021	48	48	64	62
2022	64	64	98	92
2023	82	84	136	134
2024	106	110	188	184
2025	136	140	256	250
2026	172	184	340	334
2027	212	232	440	438
2028	262	296	562	570
2029	326	370	702	728
2030	396	472	864	924
2040	1902	2270	2411	2394
2050	2482	2017	1737	1517

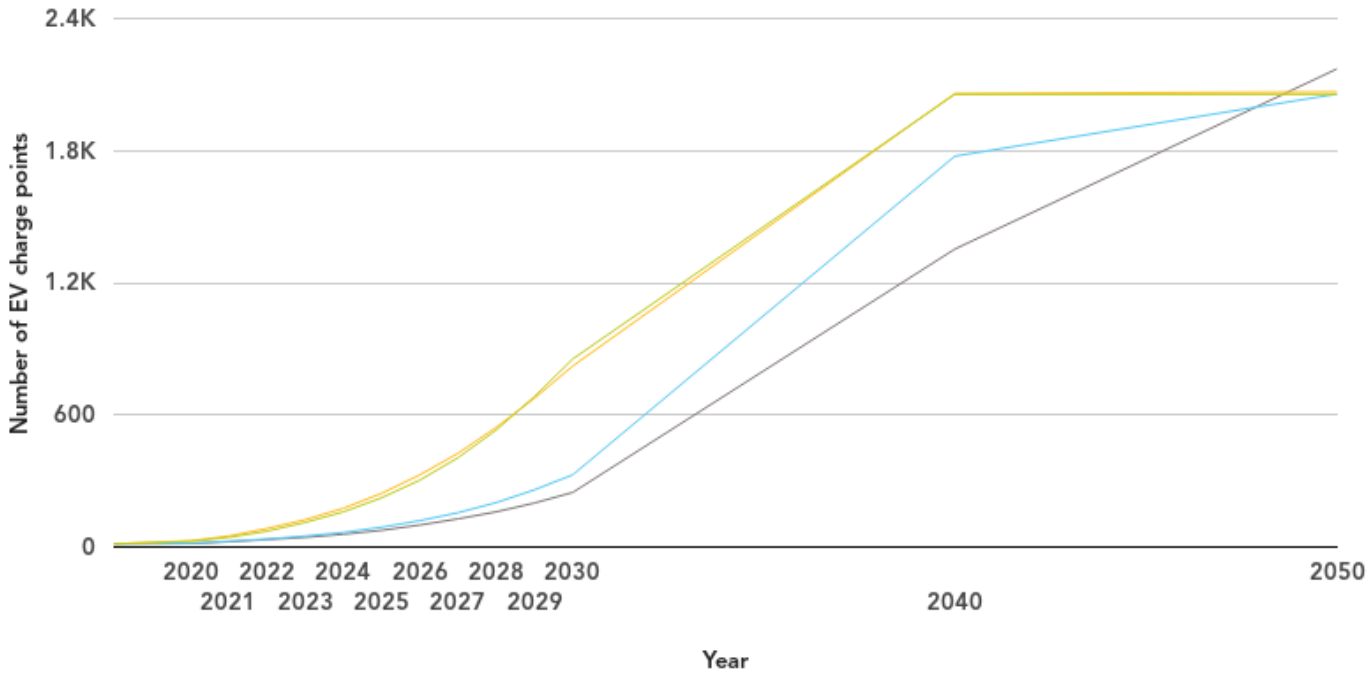


Technology Summary: EV Charge Point

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	14	14	14	14
2020	16	16	28	26
2021	24	26	50	44
2022	34	36	84	72
2023	44	50	124	112
2024	58	66	176	160
2025	76	90	244	224
2026	100	120	328	304
2027	128	156	426	406
2028	160	202	544	532
2029	200	260	676	684
2030	248	328	822	854
2040	1353	1775	2059	2056
2050	2171	2057	2067	2056

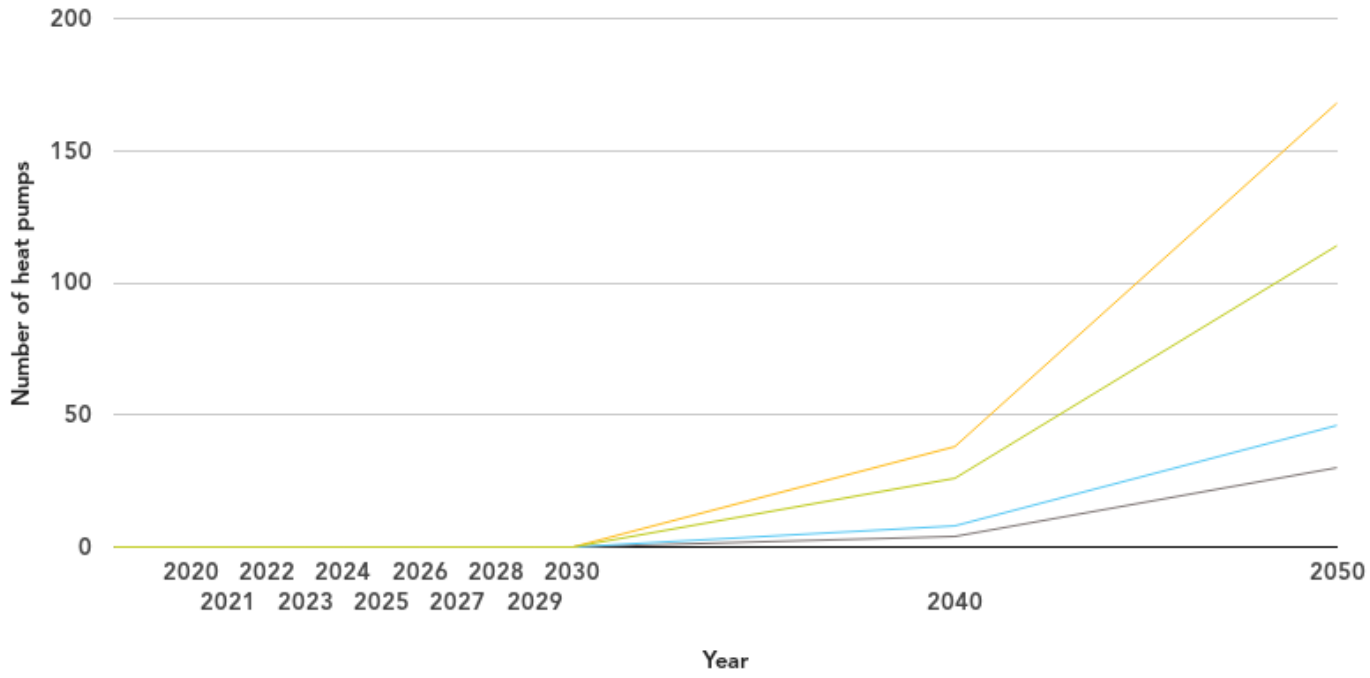


Technology Summary: Heat pumps

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0	0	0	0
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2040	4	8	38	26
2050	30	46	168	114

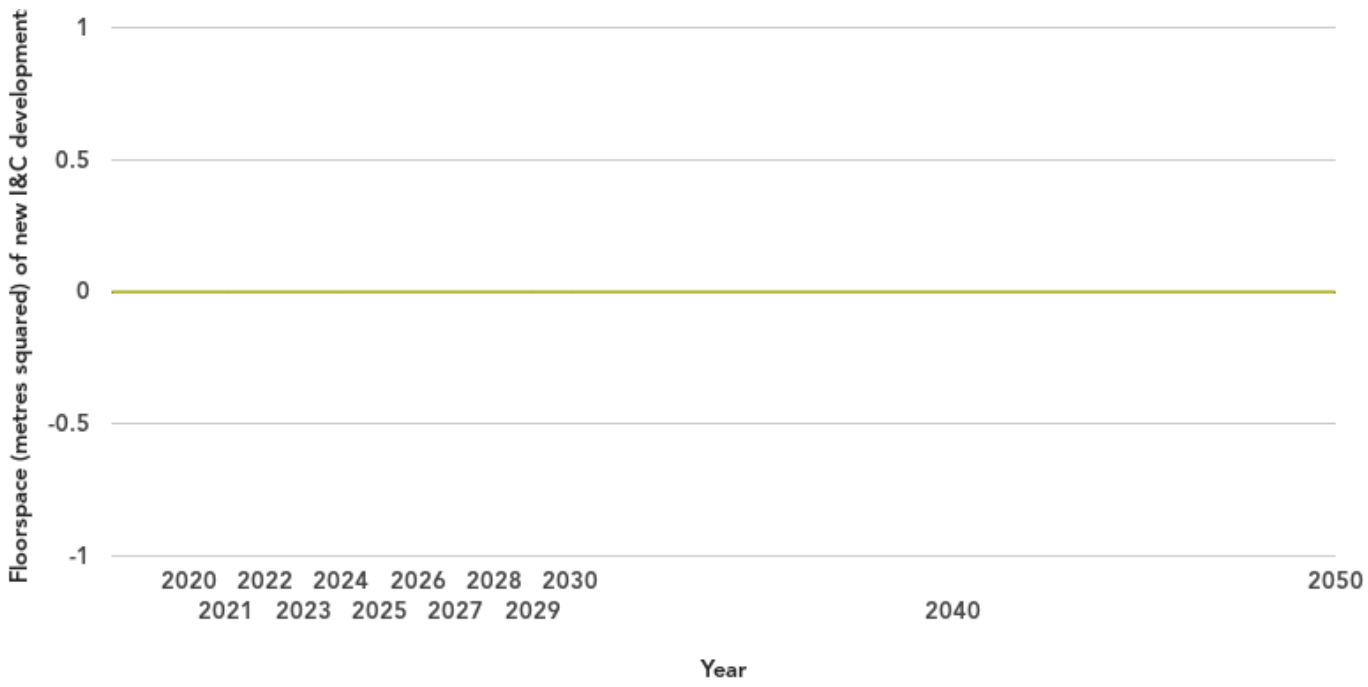


Technology Summary: Non domestic

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0
2040	0.0	0.0	0.0	0.0
2050	0.0	0.0	0.0	0.0

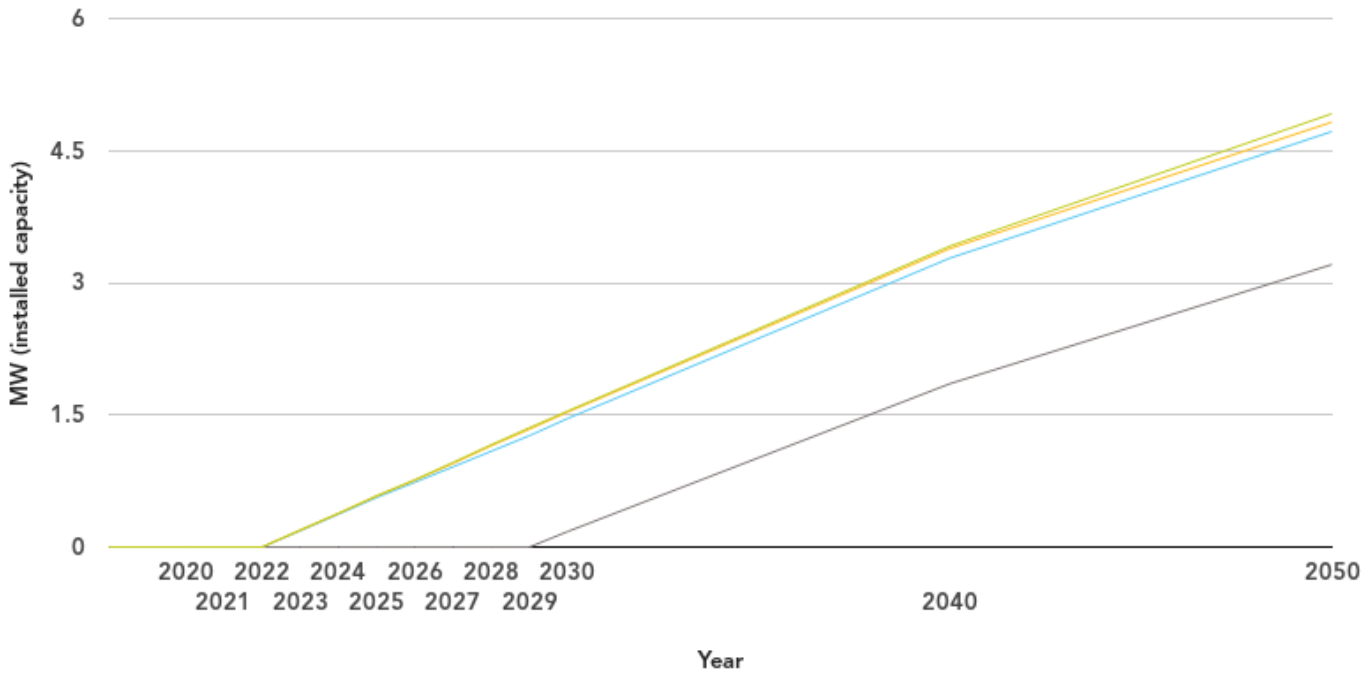


Technology Summary: Other Distributed Generation

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0
2023	0.0	0.2	0.2	0.2
2024	0.0	0.4	0.4	0.4
2025	0.0	0.6	0.6	0.6
2026	0.0	0.7	0.8	0.8
2027	0.0	0.9	0.9	1.0
2028	0.0	1.1	1.2	1.2
2029	0.0	1.3	1.3	1.4
2030	0.2	1.5	1.5	1.5
2040	1.9	3.3	3.4	3.4
2050	3.2	4.7	4.8	4.9

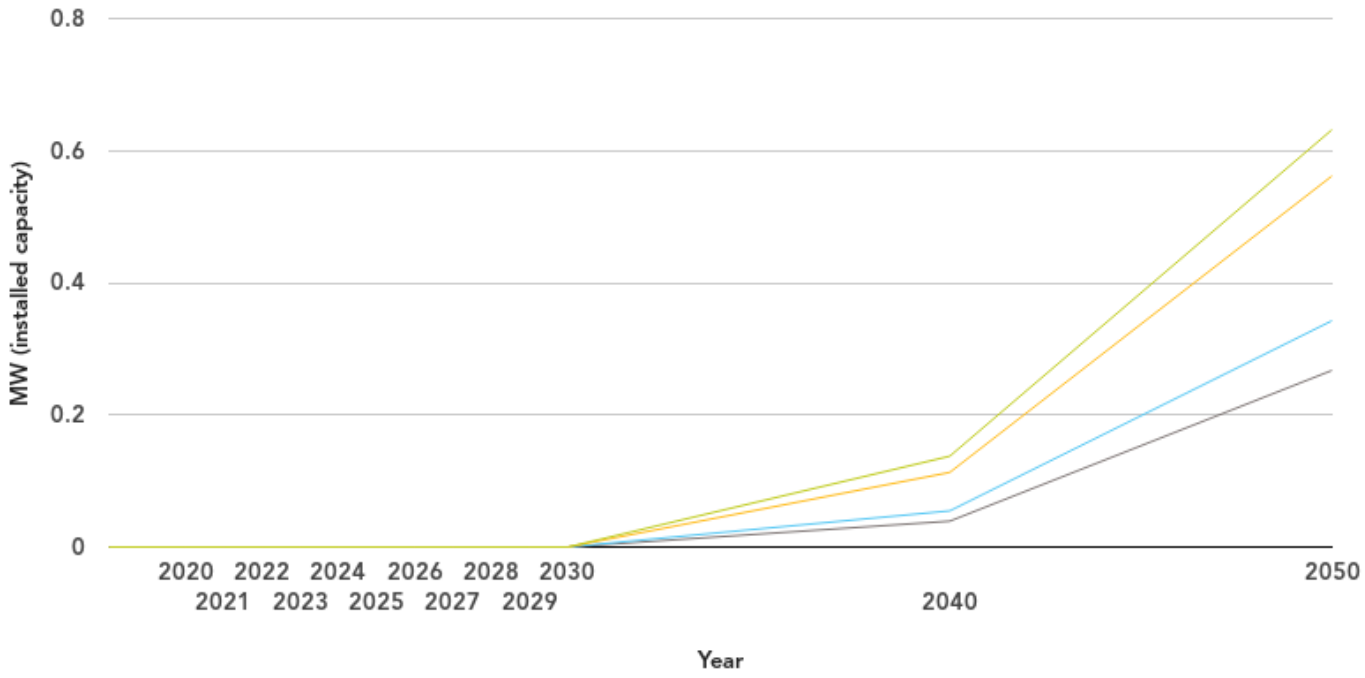


Technology Summary: Solar Generation

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0
2040	0.0	0.1	0.1	0.1
2050	0.3	0.3	0.6	0.6

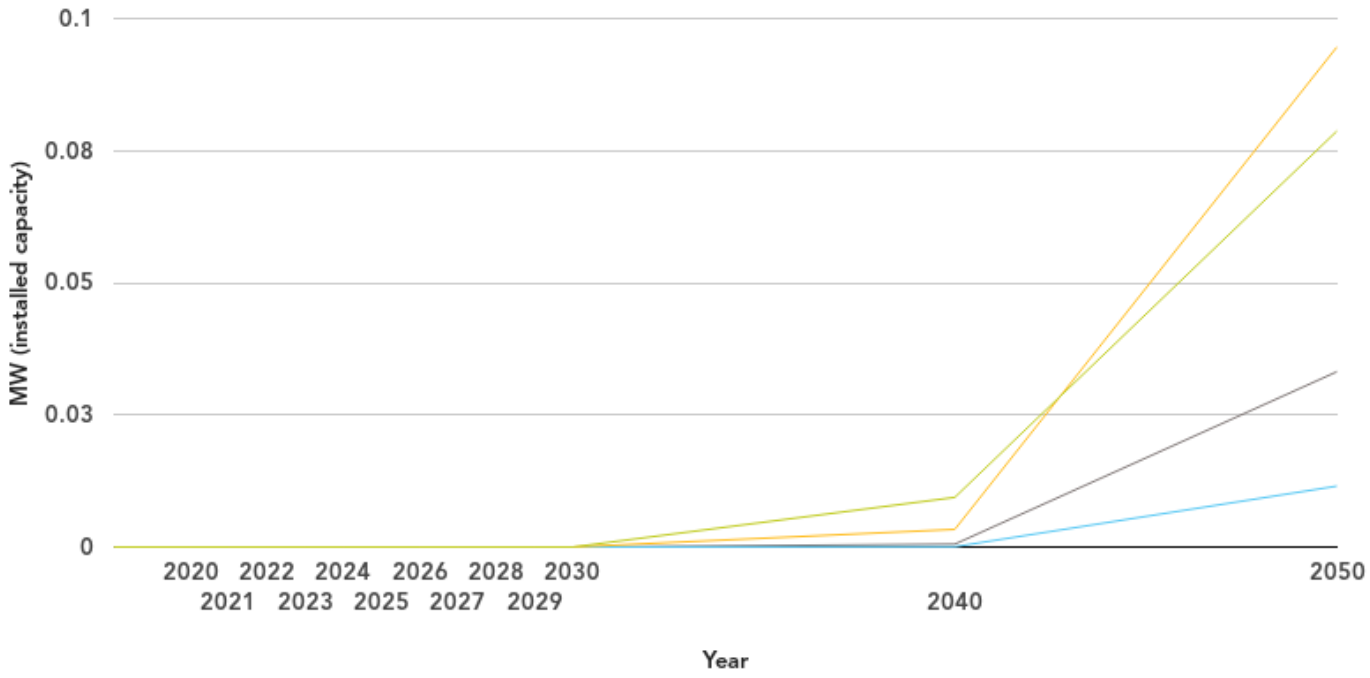


Technology Summary: Storage

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0
2040	0.0	0.0	0.0	0.0
2050	0.0	0.0	0.1	0.1

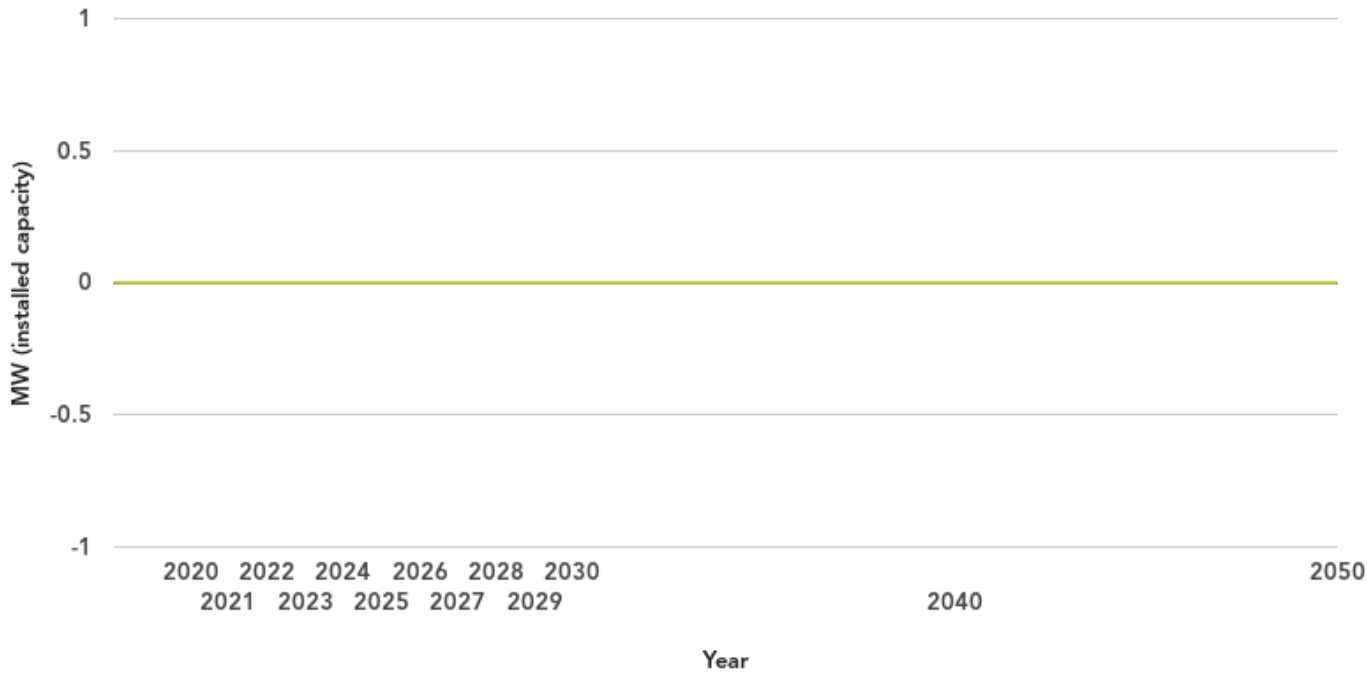


Technology Summary: Wind

The table and graph below show the scenario projections for each of the DFES scenarios.

WPD Best View scenario: aligned to Steady Progression

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0
2040	0.0	0.0	0.0	0.0
2050	0.0	0.0	0.0	0.0



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Western Power Distribution (West Midlands) plc, No3600574
Western Power Distribution (South West) plc, No2366894
Western Power Distribution (South Wales) plc, No2366985
Registered in England and Wales
Registered Office: Avonbank, Feeder Road, Bristol BS2 0TB

wpdnetworkstrategy@westernpower.co.uk