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Distribution Future Energy Scenarios

Local Authority: Teignbridge District

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What are Distribution Future Energy Scenarios?

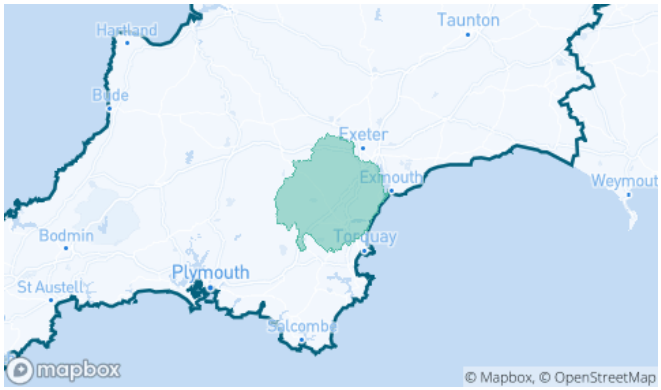
Western Power Distribution run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Teignbridge District covered by the WPD South West licence area.



Scenario Summary

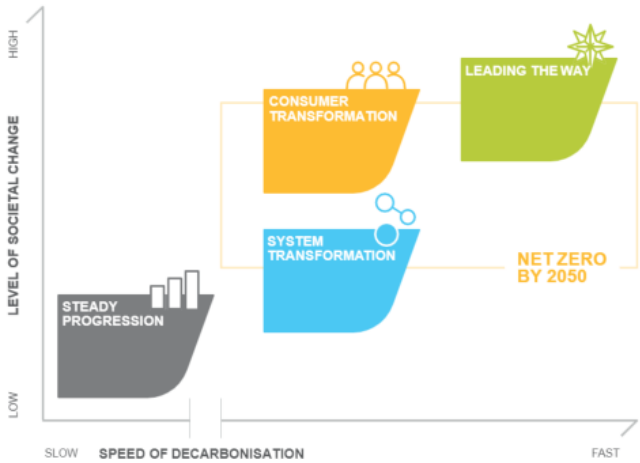
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

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 Teignbridge 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, Teignbridge District has been assigned the Consumer Transformation 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	703	2920	2442	2442	789	50621	28544	28544	933
Direct electric heating	Number of customers with direct electric heating	2011	2401	2453	2432	2549	3227	2723	2537	2871
Domestic	Number of new dwellings	0	3606	4859	4859	6321	9940	13275	13275	17530
Electric vehicles	Number of electric vehicles	795	13236	17025	29122	33529	90477	83002	75904	63623
EV Charge Point	Number of EV charge points	315	5496	7721	17989	19872	44598	46540	47758	48853
Heat pumps	Number of heat pumps	352	1147	4481	14649	17276	12486	21911	51566	50529
Non domestic	Floorspace (metres squared) of new I&C developments	0.0	181269.0	247276.0	247276.0	316913.0	384482.0	393642.0	393642.0	400166.0
Other Distributed Generation	MW (installed capacity)	32.4	37.1	32.4	32.4	32.4	40.2	28.4	29.0	6.1
Solar Generation	MW (installed capacity)	35.4	40.5	53.6	72.5	69.6	83.3	195.0	281.1	256.5
Storage	MW (installed capacity)	0.0	0.4	0.0	2.3	5.3	5.1	0.4	24.7	34.2
Wind	MW (installed capacity)	0.0	0.0	0.1	3.4	0.2	0.5	4.5	47.2	29.0

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.

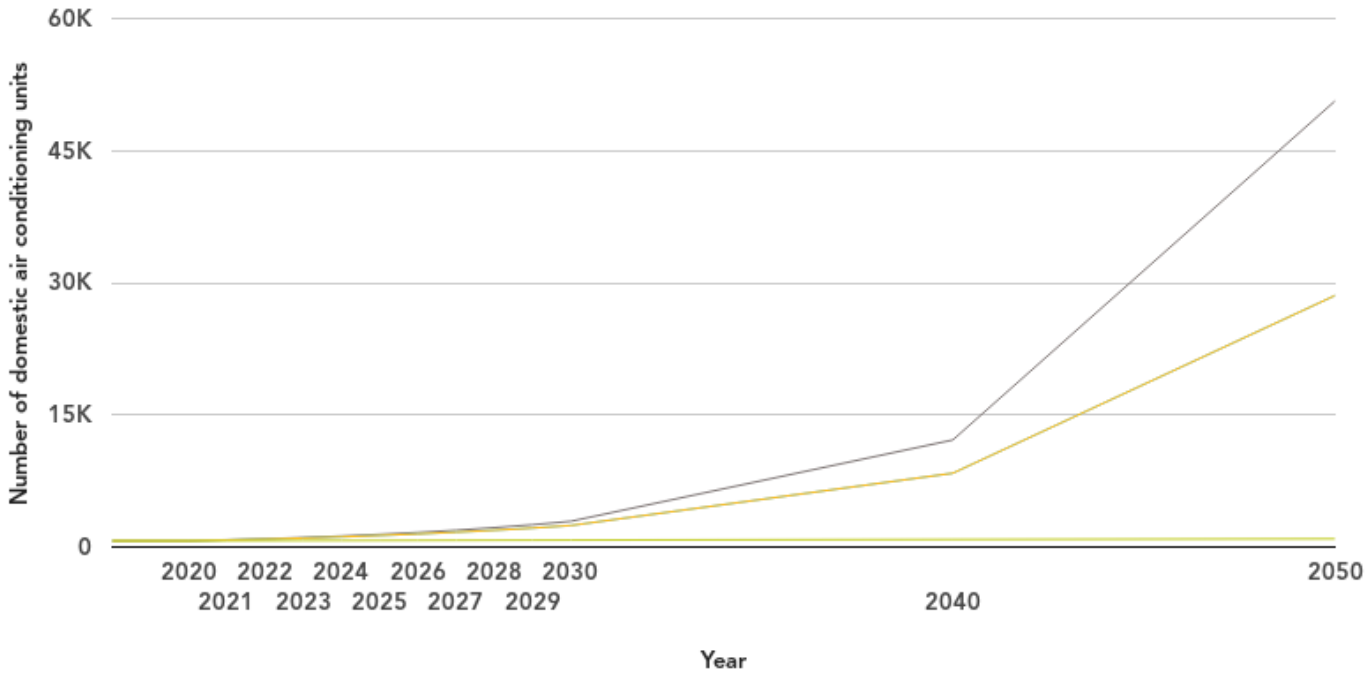
If you have any comments or queries regarding these reports, please contact wpdnetworkstrategy@westernpower.co.uk.

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 Consumer Transformation

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	703	703	703	703
2020	704	706	706	706
2021	814	798	798	713
2022	934	903	903	720
2023	1080	1022	1022	728
2024	1245	1158	1158	736
2025	1437	1313	1313	745
2026	1655	1484	1484	755
2027	1904	1682	1682	763
2028	2198	1906	1906	772
2029	2533	2153	2153	780
2030	2920	2442	2442	789
2040	12154	8379	8379	864
2050	50621	28544	28544	933

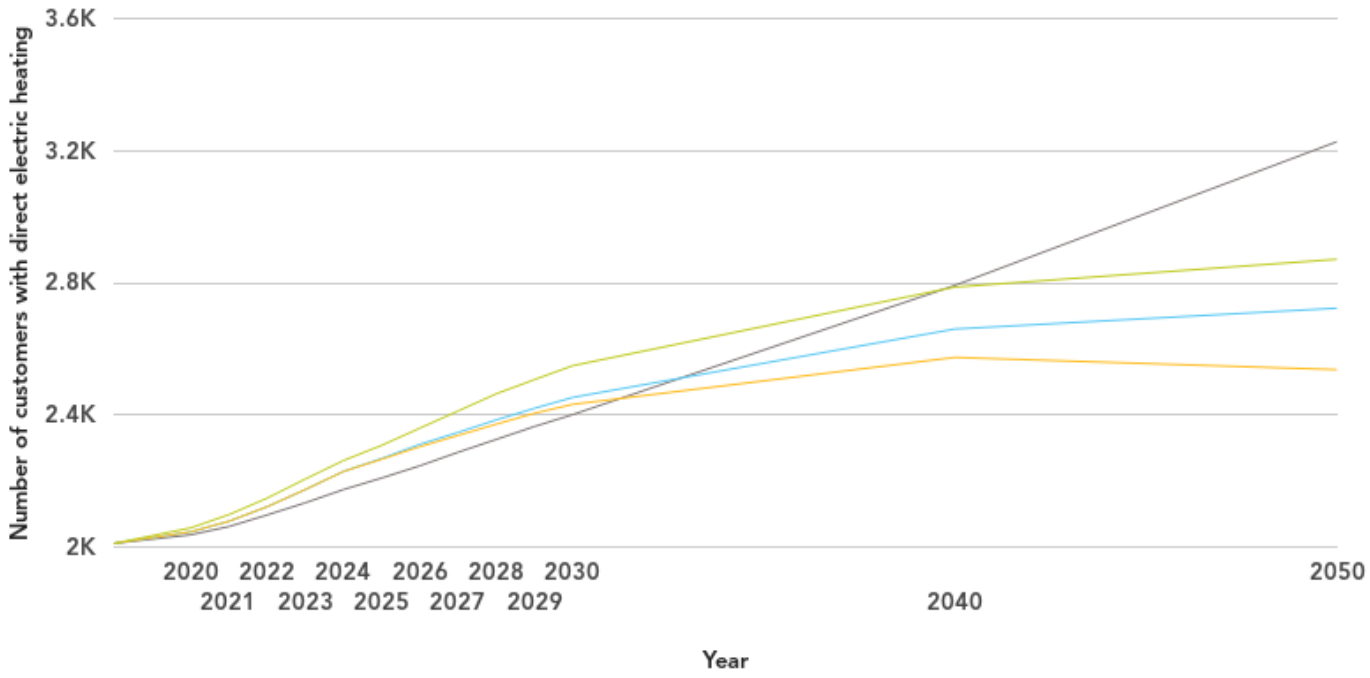


Technology Summary: Direct electric heating

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

WPD Best View scenario: aligned to Consumer Transformation

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	2011	2011	2011	2011
2020	2037	2046	2046	2058
2021	2062	2078	2078	2098
2022	2097	2122	2122	2148
2023	2134	2174	2174	2206
2024	2174	2229	2229	2262
2025	2209	2268	2266	2308
2026	2246	2311	2304	2360
2027	2287	2347	2338	2412
2028	2326	2385	2372	2464
2029	2365	2420	2405	2507
2030	2401	2453	2432	2549
2040	2792	2660	2574	2787
2050	3227	2723	2537	2871

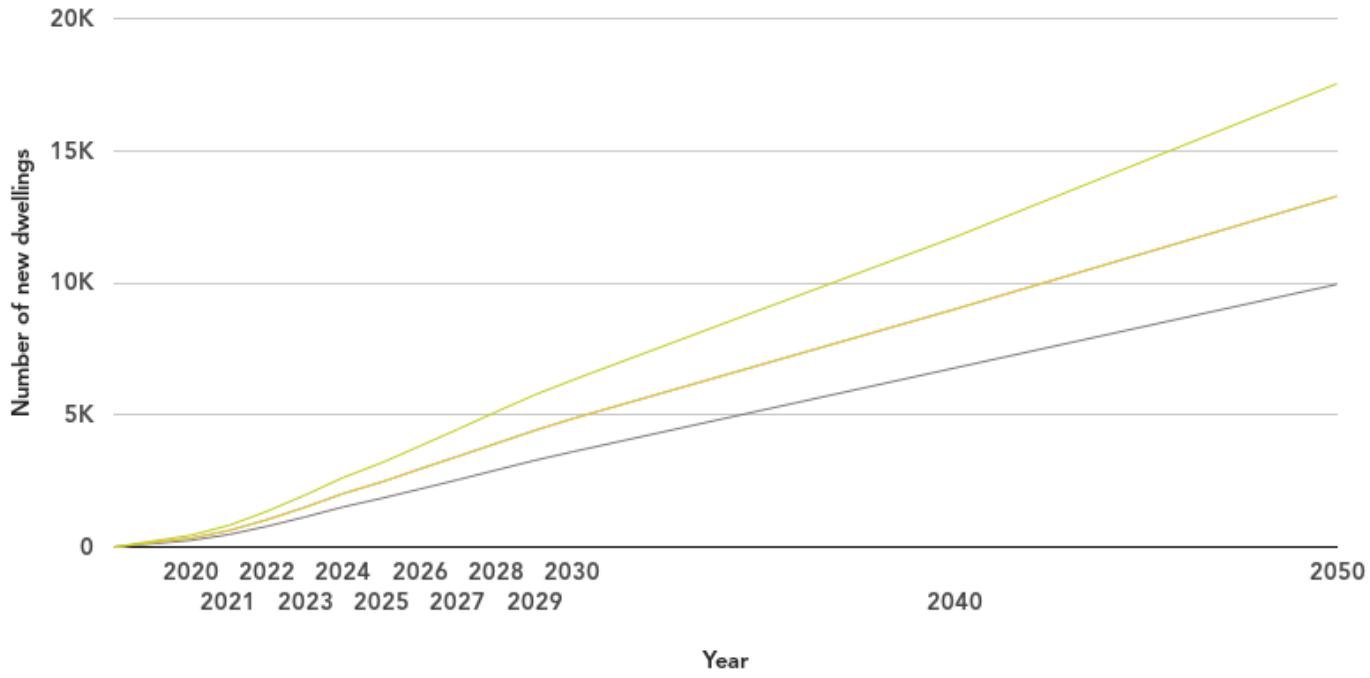


Technology Summary: Domestic

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

WPD Best View scenario: aligned to Consumer Transformation

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	0	0	0	0
2020	250	333	333	443
2021	472	622	622	817
2022	784	1035	1035	1352
2023	1140	1510	1510	1970
2024	1520	2027	2027	2634
2025	1844	2462	2462	3188
2026	2193	2954	2954	3822
2027	2548	3434	3434	4463
2028	2914	3922	3922	5118
2029	3276	4409	4409	5756
2030	3606	4859	4859	6321
2040	6776	8999	8999	11728
2050	9940	13275	13275	17530

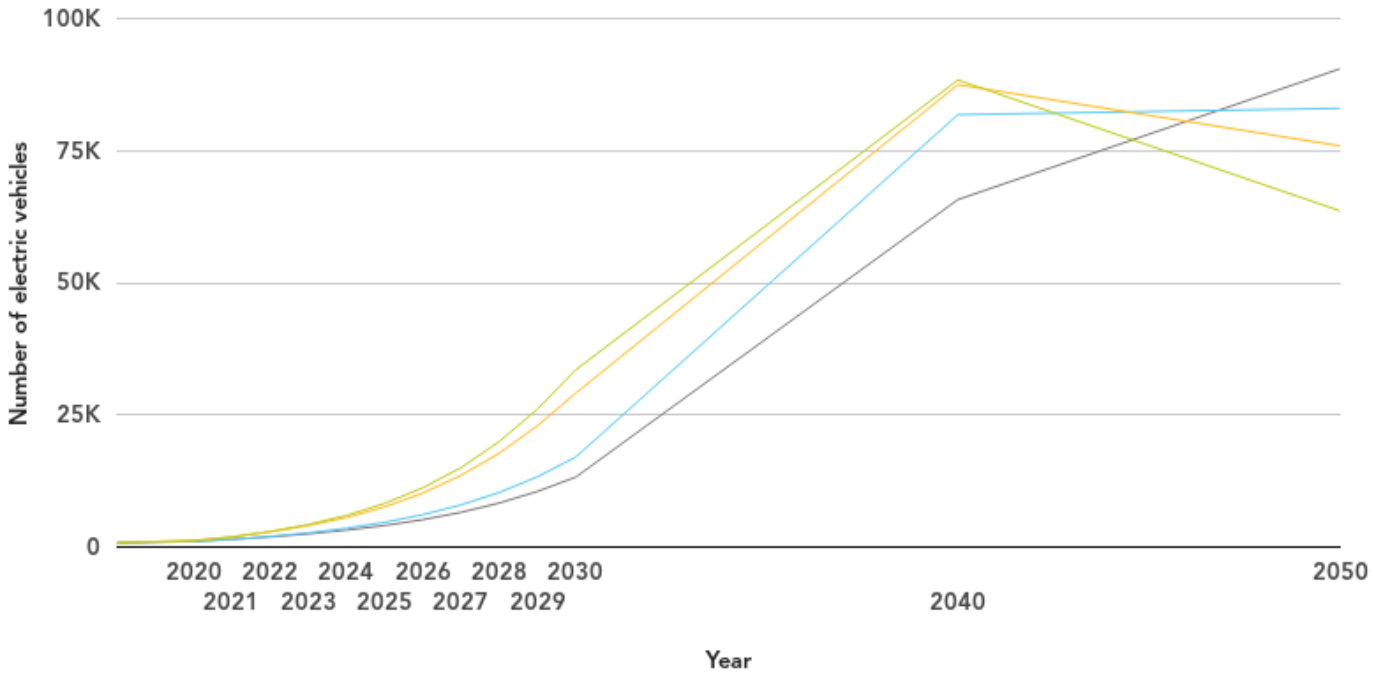


Technology Summary: Electric vehicles

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

WPD Best View scenario: aligned to Consumer Transformation

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	795	795	795	795
2020	1060	1065	1221	1225
2021	1451	1460	1904	1920
2022	1925	2000	2889	2911
2023	2488	2686	4047	4265
2024	3205	3555	5595	5972
2025	4079	4682	7600	8257
2026	5182	6124	10216	11228
2027	6568	7980	13570	15039
2028	8332	10327	17776	19976
2029	10525	13303	22965	26126
2030	13236	17025	29122	33529
2040	65733	81807	87484	88370
2050	90477	83002	75904	63623

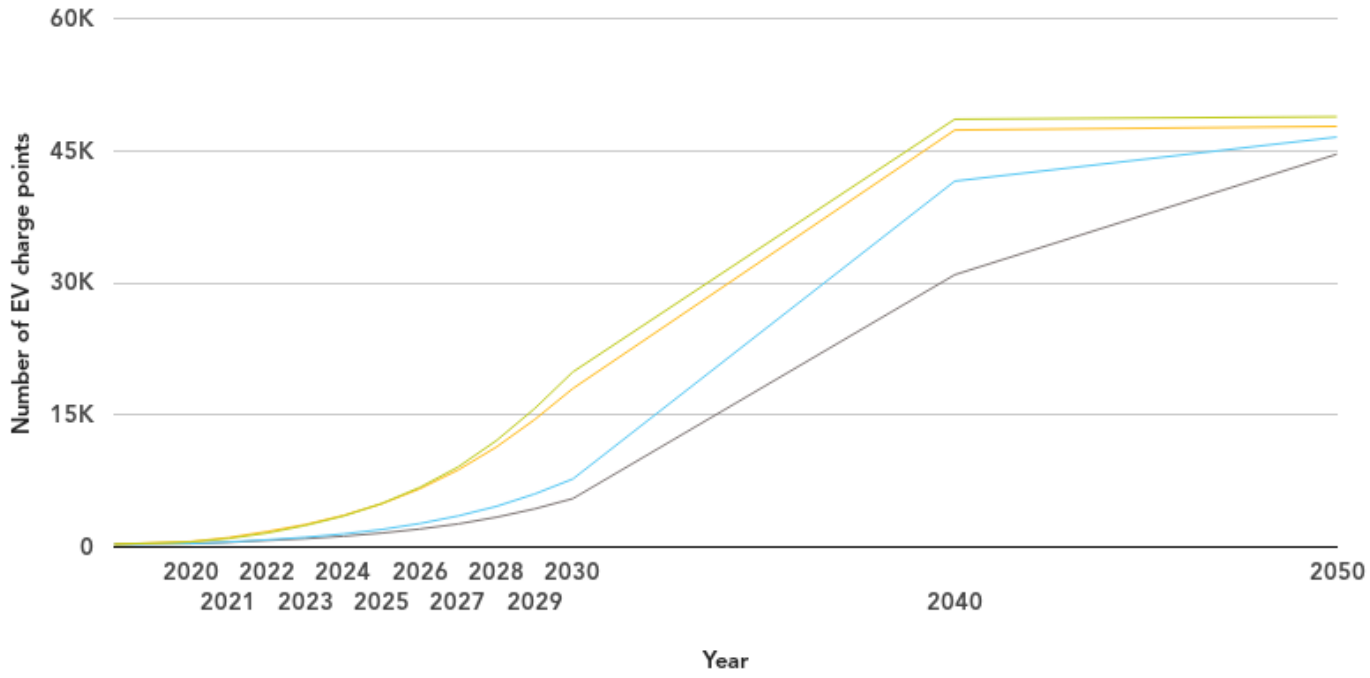


Technology Summary: EV Charge Point

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

WPD Best View scenario: aligned to Consumer Transformation

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	315	315	315	315
2020	385	396	615	575
2021	534	567	1076	974
2022	746	820	1762	1587
2023	950	1107	2550	2453
2024	1228	1489	3592	3525
2025	1586	1993	4916	4936
2026	2045	2671	6617	6778
2027	2624	3531	8751	9088
2028	3382	4613	11353	12080
2029	4332	6017	14462	15708
2030	5496	7721	17989	19872
2040	30913	41542	47341	48574
2050	44598	46540	47758	48853

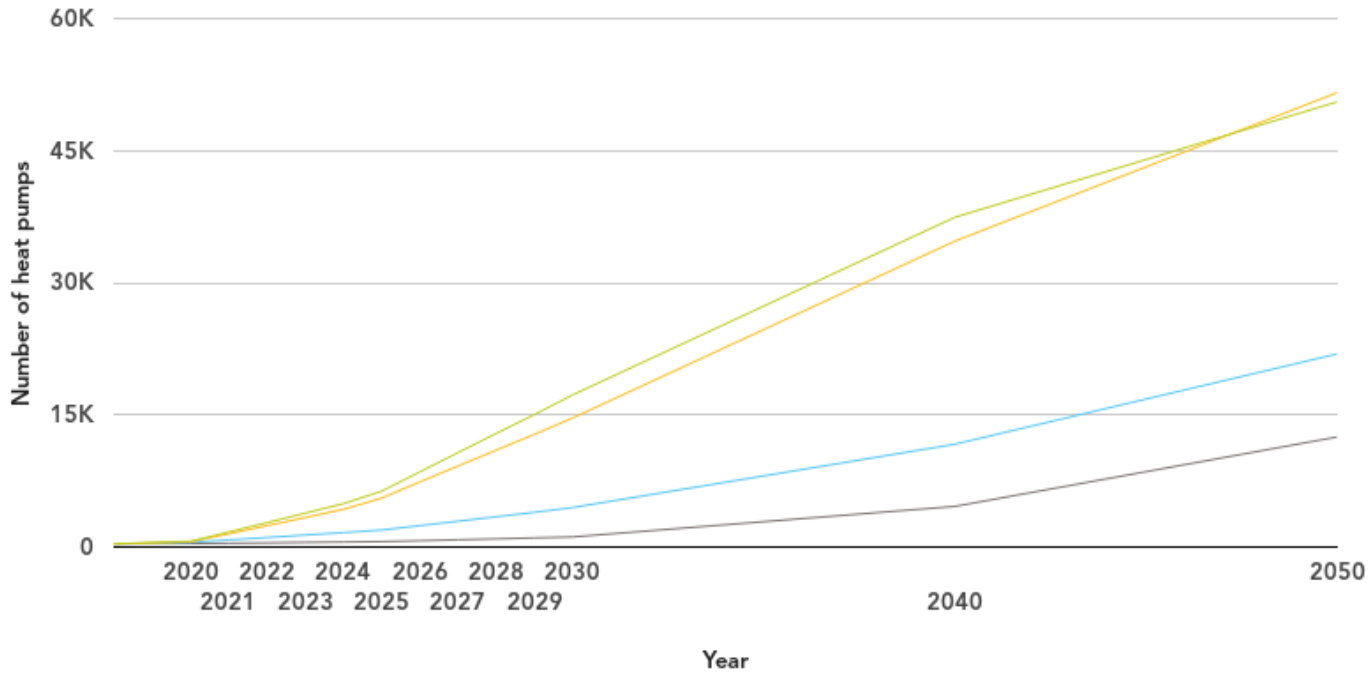


Technology Summary: Heat pumps

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

WPD Best View scenario: aligned to Consumer Transformation

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	352	352	352	352
2020	398	532	591	650
2021	436	806	1499	1704
2022	475	1080	2418	2770
2023	522	1358	3346	3847
2024	566	1634	4280	4932
2025	612	1926	5560	6340
2026	713	2428	7394	8539
2027	824	2929	9205	10724
2028	928	3435	11008	12902
2029	1038	3942	12797	15049
2030	1147	4481	14649	17276
2040	4612	11669	34724	37434
2050	12486	21911	51566	50529

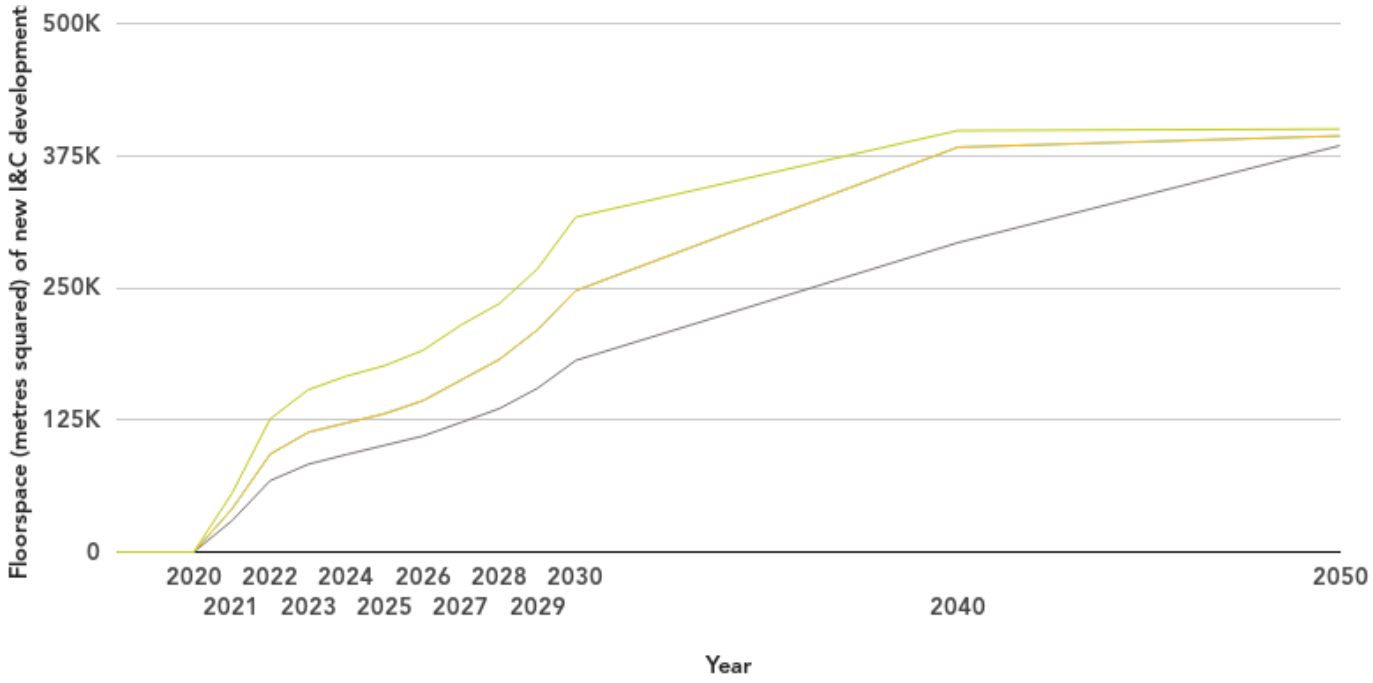


Technology Summary: Non domestic

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

WPD Best View scenario: aligned to Consumer Transformation

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	29575.0	40666.0	40666.0	55454.0
2022	67526.0	92571.0	92571.0	125965.0
2023	83060.0	113305.0	113305.0	153633.0
2024	92253.0	122137.0	122137.0	166424.0
2025	101002.0	130914.0	130914.0	176381.0
2026	109731.0	143205.0	143205.0	190797.0
2027	122642.0	162735.0	162735.0	214801.0
2028	135710.0	182229.0	182229.0	235032.0
2029	154978.0	210212.0	210212.0	267983.0
2030	181269.0	247276.0	247276.0	316913.0
2040	292628.0	382980.0	382980.0	398715.0
2050	384482.0	393642.0	393642.0	400166.0

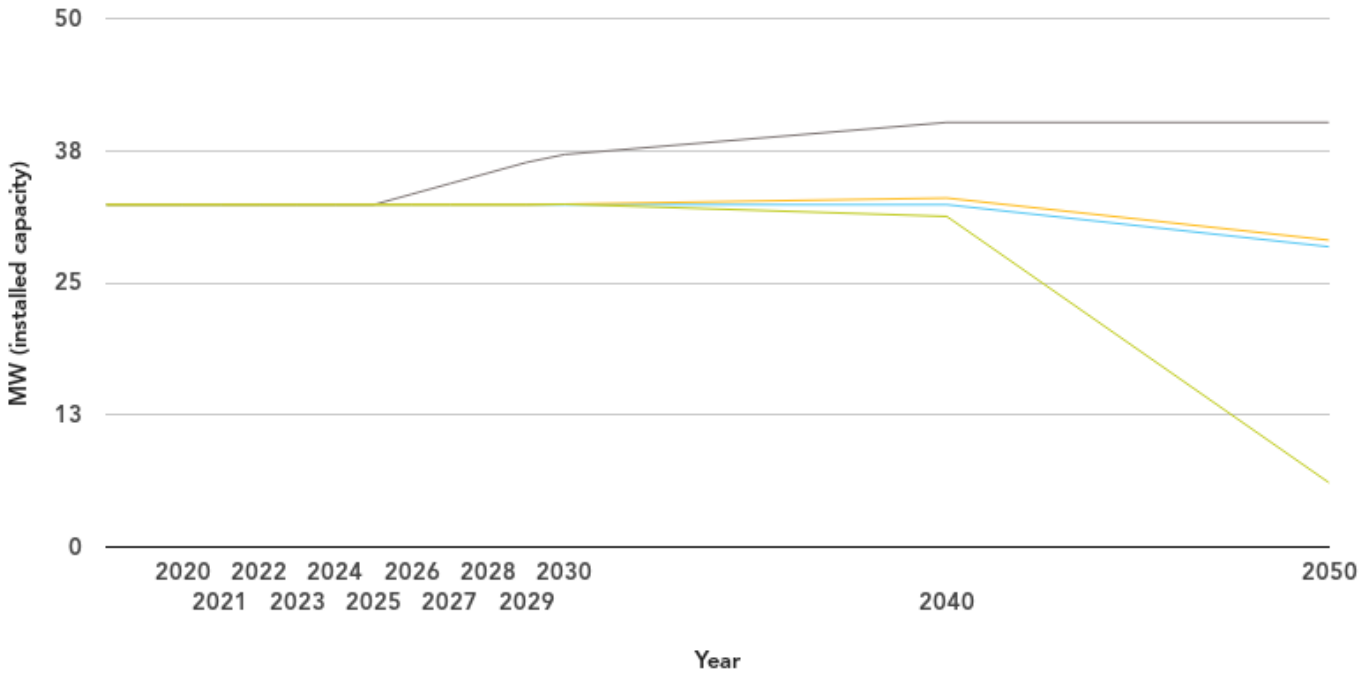


Technology Summary: Other Distributed Generation

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

WPD Best View scenario: aligned to Consumer Transformation

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	32.4	32.4	32.4	32.4
2020	32.4	32.4	32.4	32.4
2021	32.4	32.4	32.4	32.4
2022	32.4	32.4	32.4	32.4
2023	32.4	32.4	32.4	32.4
2024	32.4	32.4	32.4	32.4
2025	32.4	32.4	32.4	32.4
2026	33.4	32.4	32.4	32.4
2027	34.4	32.4	32.4	32.4
2028	35.4	32.4	32.4	32.4
2029	36.4	32.4	32.4	32.4
2030	37.1	32.4	32.4	32.4
2040	40.2	32.4	33.0	31.3
2050	40.2	28.4	29.0	6.1

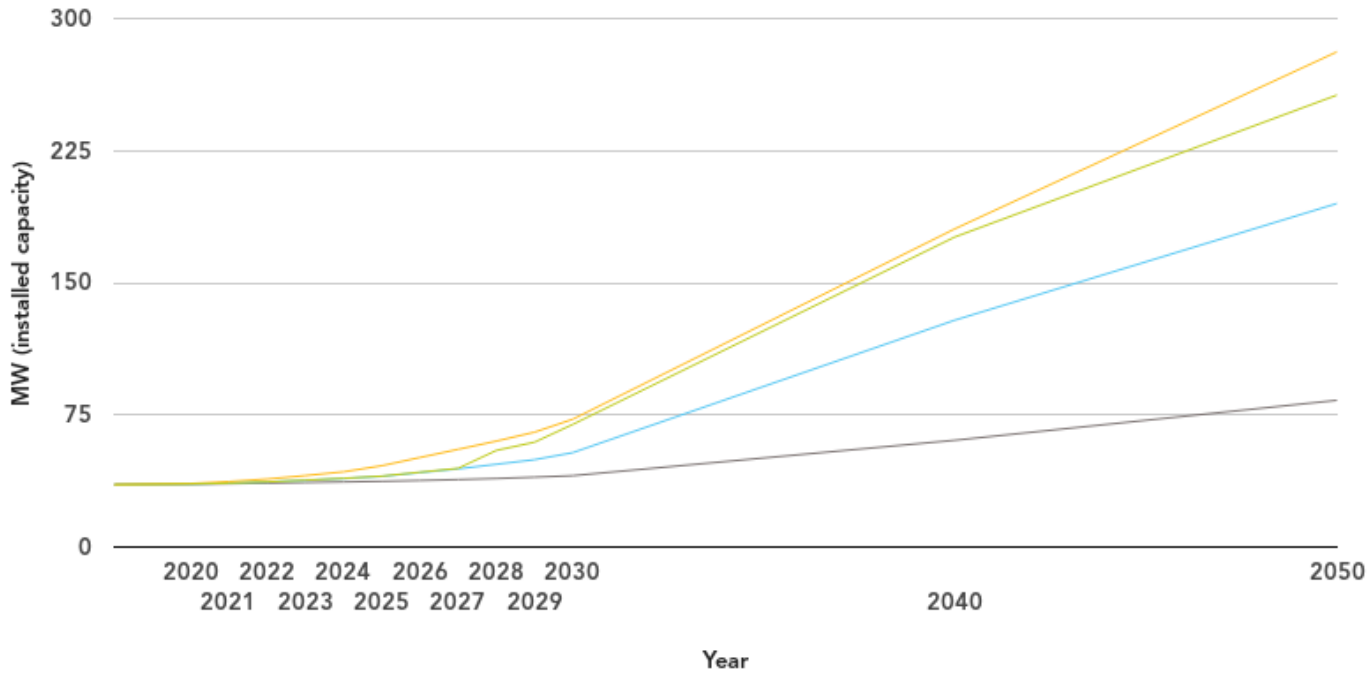


Technology Summary: Solar Generation

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

WPD Best View scenario: aligned to Consumer Transformation

Year	Scenario			
	Steady Progression	System Transformation	Consumer Transformation	Leading the Way
Baseline	35.4	35.4	35.4	35.4
2020	35.6	35.8	36.1	35.8
2021	35.9	36.3	37.1	36.3
2022	36.3	37.0	38.6	37.0
2023	36.6	37.9	40.6	37.9
2024	36.9	38.9	42.7	39.0
2025	37.3	40.1	46.2	40.2
2026	37.8	42.3	50.8	42.5
2027	38.3	44.4	55.5	44.7
2028	38.9	47.0	60.1	54.8
2029	39.7	49.6	65.2	59.5
2030	40.5	53.6	72.5	69.6
2040	60.6	128.8	180.6	176.0
2050	83.3	195.0	281.1	256.5

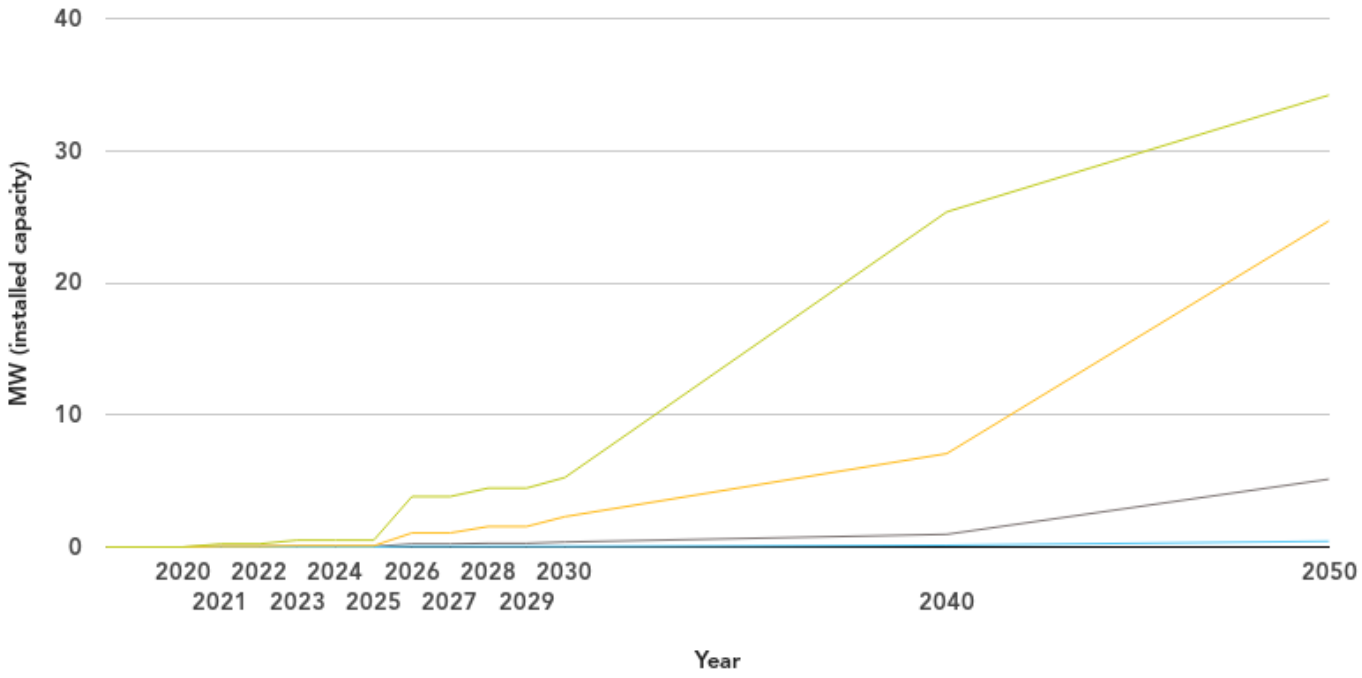


Technology Summary: Storage

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

WPD Best View scenario: aligned to Consumer Transformation

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	0.2
2022	0.0	0.0	0.0	0.2
2023	0.0	0.0	0.1	0.5
2024	0.0	0.0	0.1	0.5
2025	0.0	0.0	0.1	0.5
2026	0.2	0.0	1.1	3.8
2027	0.2	0.0	1.1	3.8
2028	0.3	0.0	1.6	4.5
2029	0.3	0.0	1.6	4.5
2030	0.4	0.0	2.3	5.3
2040	1.0	0.1	7.1	25.4
2050	5.1	0.4	24.7	34.2

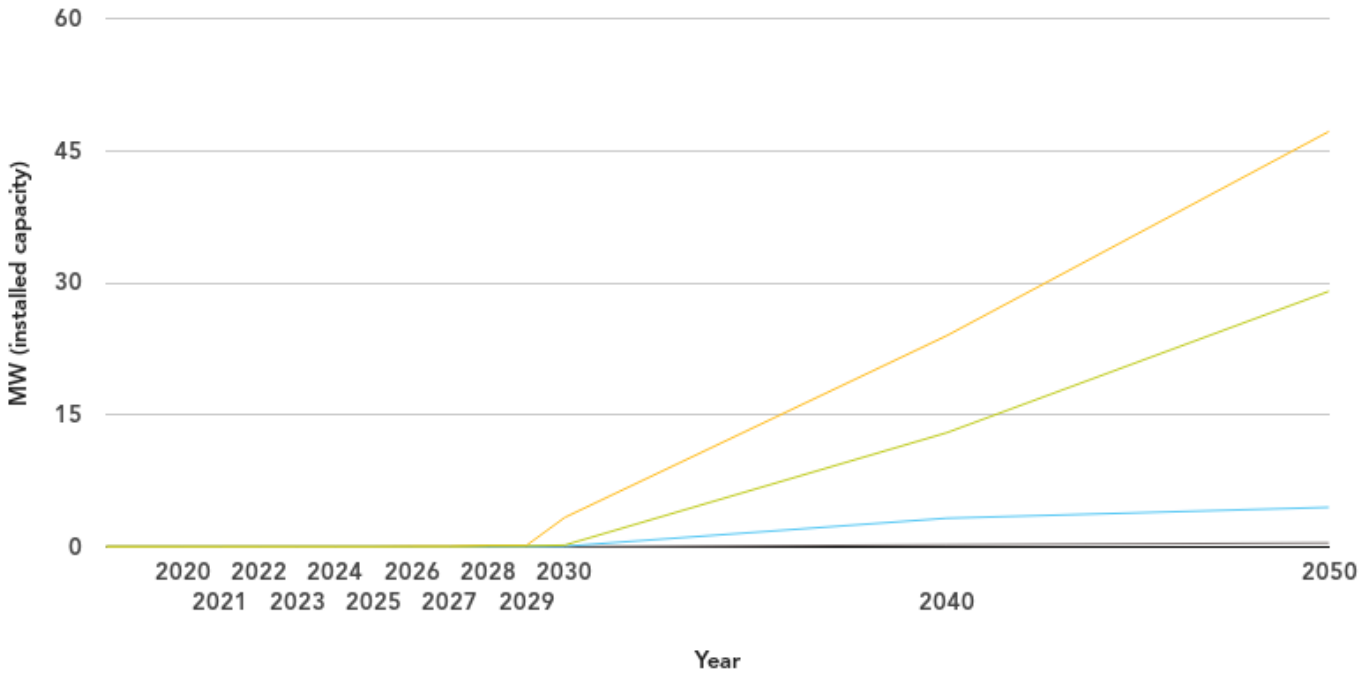


Technology Summary: Wind

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

WPD Best View scenario: aligned to Consumer Transformation

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	0.1	0.1
2027	0.0	0.0	0.1	0.1
2028	0.0	0.1	0.2	0.1
2029	0.0	0.1	0.2	0.1
2030	0.0	0.1	3.4	0.2
2040	0.3	3.3	24.0	13.0
2050	0.5	4.5	47.2	29.0



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