

# Distribution Future Energy Scenarios 2022

Local Authority:  
Cornwall

## What are Distribution Future Energy Scenarios?

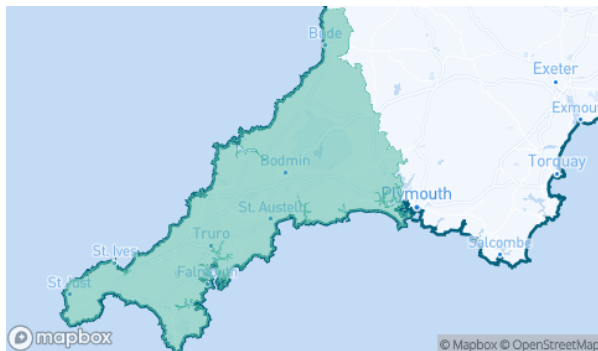
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 NGED 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 Cornwall covered by the NGED licence areas.



## 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:

**Falling Short (FS)** 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 Cornwall for two specific years in the DFES analysis.

NGED also created a 5th 'Best View' forecast for the purposes of regulatory reporting and strategic network planning. This is a hybrid forecast built on local stakeholder engagement and historic performance, which reflects local authority ambition for the technologies where its influence is greatest. The Best View informs the likely amount of investment on the network across a licence area; however, changes in regional growth projections that affect investment requirements are supported through the uncertainty mechanism funding process.

Technology	Units	Baseline Total	2030				2050			
			FS	ST	CT	LW	FS	ST	CT	LW
Air conditioning	Domestic air conditioning units	205	1554	1075	1075	205	84512	39622	39621	205
Domestic	New dwellings	0	8204	8770	8770	9998	11938	11627	11627	11406
Electric vehicles	Electric vehicles	5984	51414	66515	122728	122830	389346	348189	347841	298325
EV Charge Point	EV charge points	3412	22572	34452	64847	71084	209290	208699	209015	217402
Heat pumps	Heat pump installations	9312	41119	39485	67590	90867	158761	175735	270807	248850
Hydrogen electrolysis	MW (installed capacity)	0.0	0.3	12.9	2.1	5.0	16.5	165.7	120.2	176.5
Non domestic	Floorspace (metres squared) of new I&C developments	0	473259	559314	559314	605848	861109	859066	859066	861109
Other Distributed Generation	MW (installed capacity)	84.9	73.9	41.8	27.1	64.6	42.7	84.6	114.1	160.8
Resistive electric heating	Resistive electric heating units	98761	79450	77629	82274	78437	46374	19148	50754	53202
Solar Generation	MW (installed capacity)	175.9	214.0	274.3	348.2	378.2	515.4	925.5	1225.6	1328.2
Storage	MW (installed capacity)	0.3	1.4	7.4	16.0	23.6	24.7	65.8	158.3	203.5
Wind	MW (installed capacity)	50.5	53.4	58.5	103.2	88.6	129.3	205.7	481.7	394.9

## 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 NGED investment planning process, which includes the Network Development Plan and Distribution Network Options Assessment.

## Incorporating your feedback

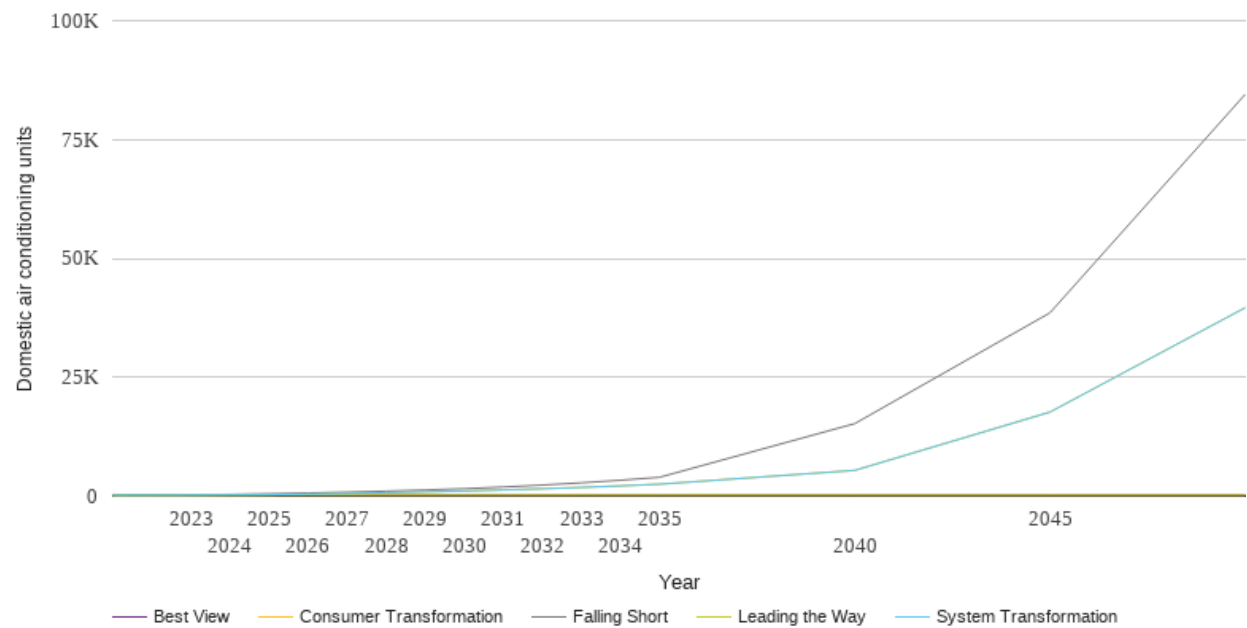
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios analysis.

If you have any comments or queries regarding these reports, please contact [nged.energyplanning@nationalgrid.co.uk](mailto:nged.energyplanning@nationalgrid.co.uk).

# Technology Summary: Air conditioning

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

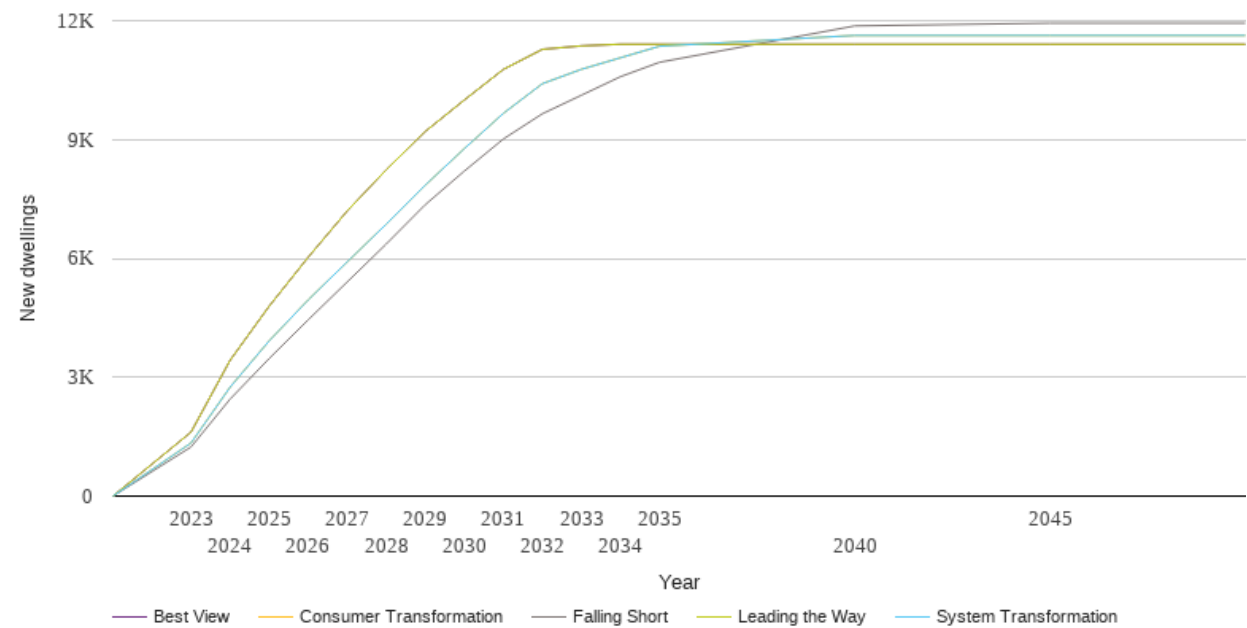
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	205	205	205	205	205
2023	235	232	232	205	205
2024	353	260	260	205	205
2025	490	293	293	205	205
2026	647	412	412	205	205
2027	828	548	548	205	205
2028	1036	704	704	205	205
2029	1279	879	879	205	205
2030	1554	1075	1075	205	205
2031	1912	1297	1297	205	205
2032	2321	1548	1548	205	205
2033	2794	1828	1828	205	205
2034	3338	2149	2149	205	205
2035	3958	2504	2504	205	205
2040	15247	5408	5408	205	205
2045	38548	17673	17673	205	205
2050	84512	39622	39621	205	205



# Technology Summary: Domestic

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

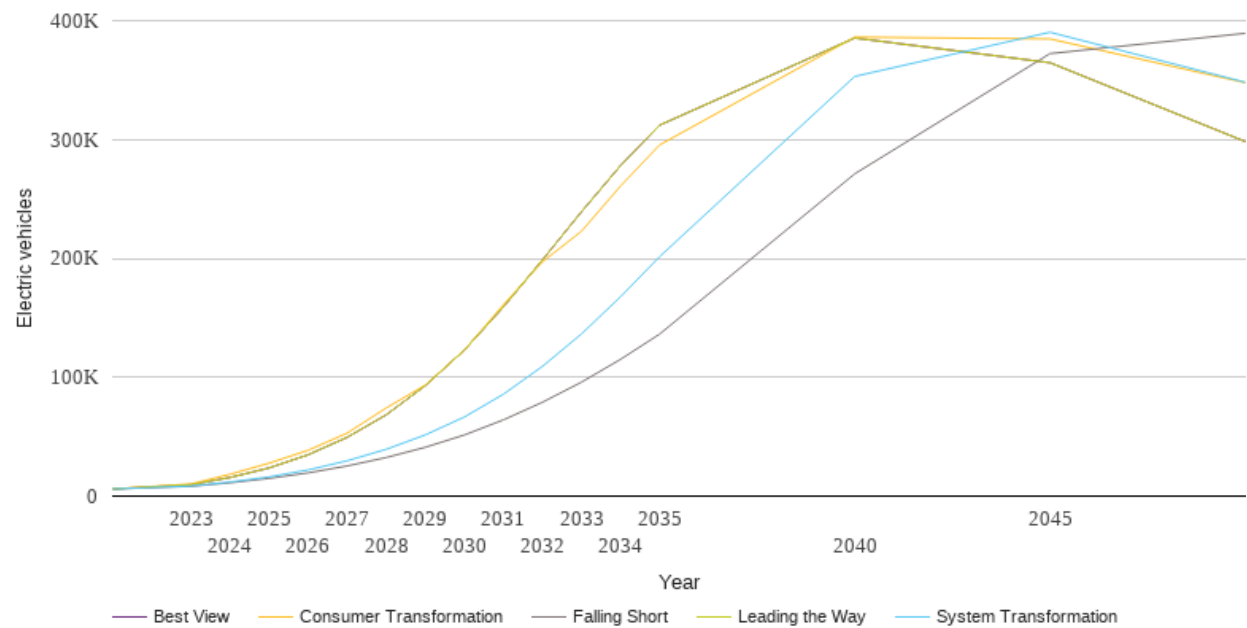
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	1240	1340	1340	1615	1615
2024	2447	2748	2748	3427	3427
2025	3471	3917	3917	4792	4792
2026	4448	4951	4951	6028	6028
2027	5405	5911	5911	7197	7197
2028	6363	6863	6863	8237	8237
2029	7356	7849	7849	9204	9204
2030	8204	8770	8770	9998	9998
2031	9014	9661	9661	10770	10770
2032	9651	10410	10410	11277	11277
2033	10119	10773	10773	11364	11364
2034	10587	11064	11064	11406	11406
2035	10950	11355	11355	11406	11406
2040	11868	11627	11627	11406	11406
2045	11938	11627	11627	11406	11406
2050	11938	11627	11627	11406	11406



# Technology Summary: Electric vehicles

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

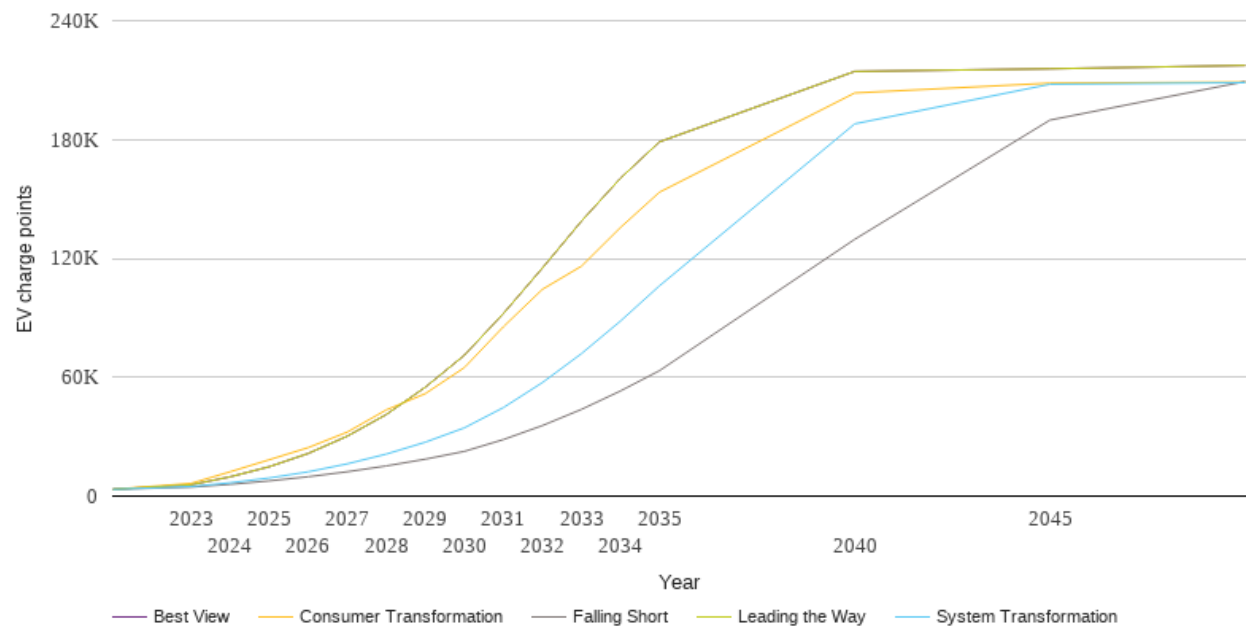
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	5984	5984	5984	5984	5984
2023	8265	8464	10234	9612	9612
2024	11218	11814	18335	15676	15676
2025	14913	16159	27707	23691	23691
2026	19528	22009	38543	34770	34770
2027	25368	29711	53019	49465	49465
2028	32443	39363	74176	68388	68388
2029	41070	51491	93400	92935	92935
2030	51414	66515	122728	122830	122830
2031	64128	85701	160992	159085	159085
2032	78949	109109	197110	198674	198674
2033	95862	136424	222802	239229	239229
2034	115011	167634	260850	278055	278055
2035	136228	201394	295423	312034	312034
2040	271169	353101	386193	385439	385439
2045	372297	390278	384655	364652	364652
2050	389346	348189	347841	298325	298325



# Technology Summary: EV Charge Point

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

Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	3412	3412	3412	3412	3412
2023	4517	4808	6410	5701	5701
2024	5926	6711	12262	9717	9717
2025	7673	9141	18330	14811	14811
2026	9764	12249	24468	21507	21507
2027	12281	16277	32301	30238	30238
2028	15218	21204	43495	41152	41152
2029	18641	27205	51717	54963	54963
2030	22572	34452	64847	71084	71084
2031	28541	44682	85483	92157	92157
2032	35605	57310	104378	115124	115124
2033	43776	71924	116065	138789	138789
2034	53072	88361	135595	160489	160489
2035	63347	106190	153439	178836	178836
2040	129641	187917	203510	214395	214395
2045	189832	207920	208476	215717	215717
2050	209290	208699	209015	217402	217402

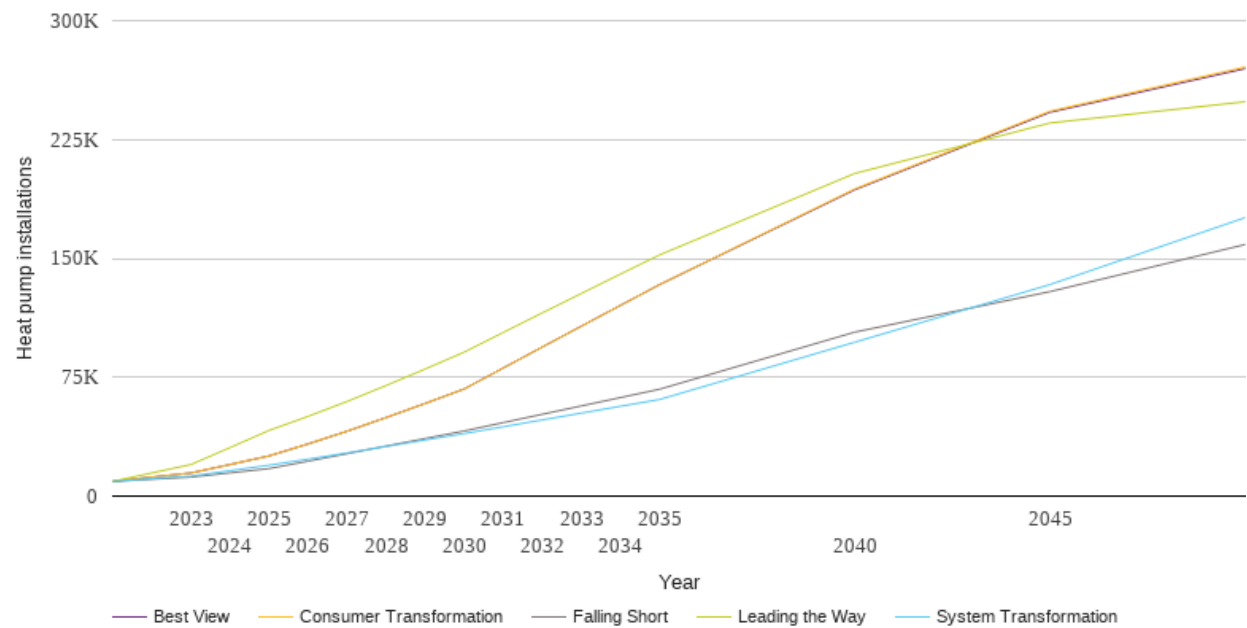




# Technology Summary: Heat pumps

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

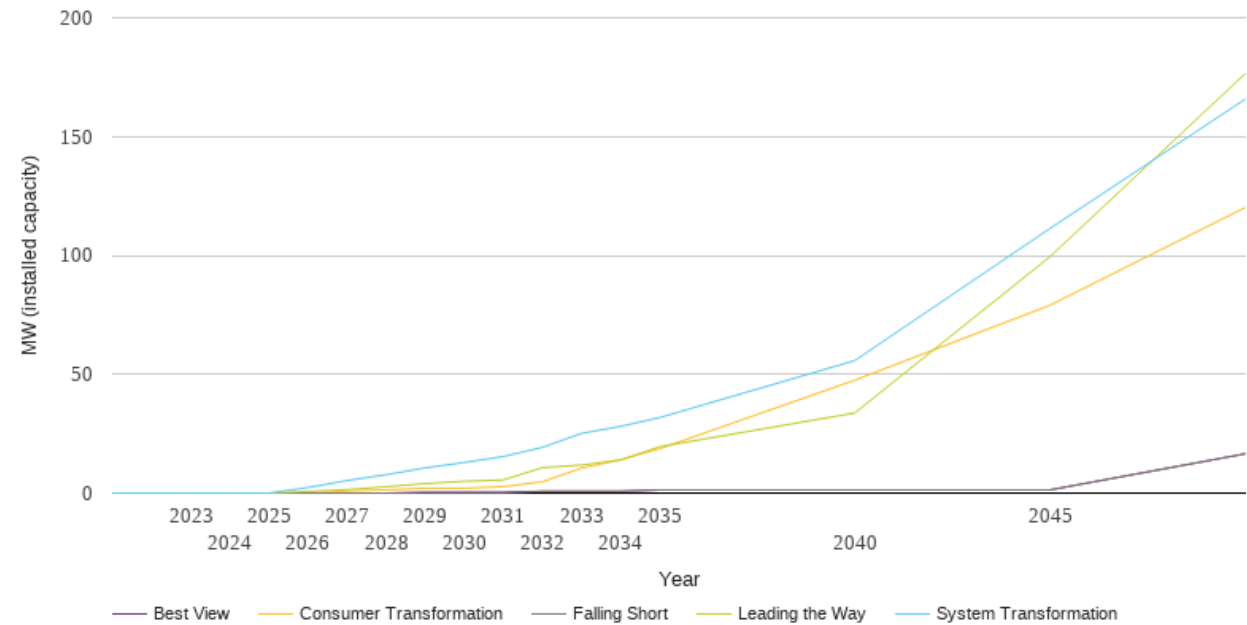
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	9312	9312	9312	9312	9312
2023	11990	12649	14603	19939	14603
2024	14669	16023	19922	30627	19922
2025	17368	19502	25355	41465	25355
2026	22054	23310	32912	50315	32920
2027	26789	27254	40965	59746	40976
2028	31566	31329	49572	69805	49592
2029	36330	35413	58448	80202	58482
2030	41119	39485	67590	90867	67622
2031	46382	43765	80835	103284	80866
2032	51647	48072	94056	115646	94083
2033	56919	52375	107228	127891	107252
2034	62172	56674	120340	140095	120363
2035	67430	60961	133412	152192	133428
2040	103459	97099	193819	203580	193307
2045	129012	133467	242880	235431	242190
2050	158761	175735	270807	248850	269782



# Technology Summary: Hydrogen electrolysis

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

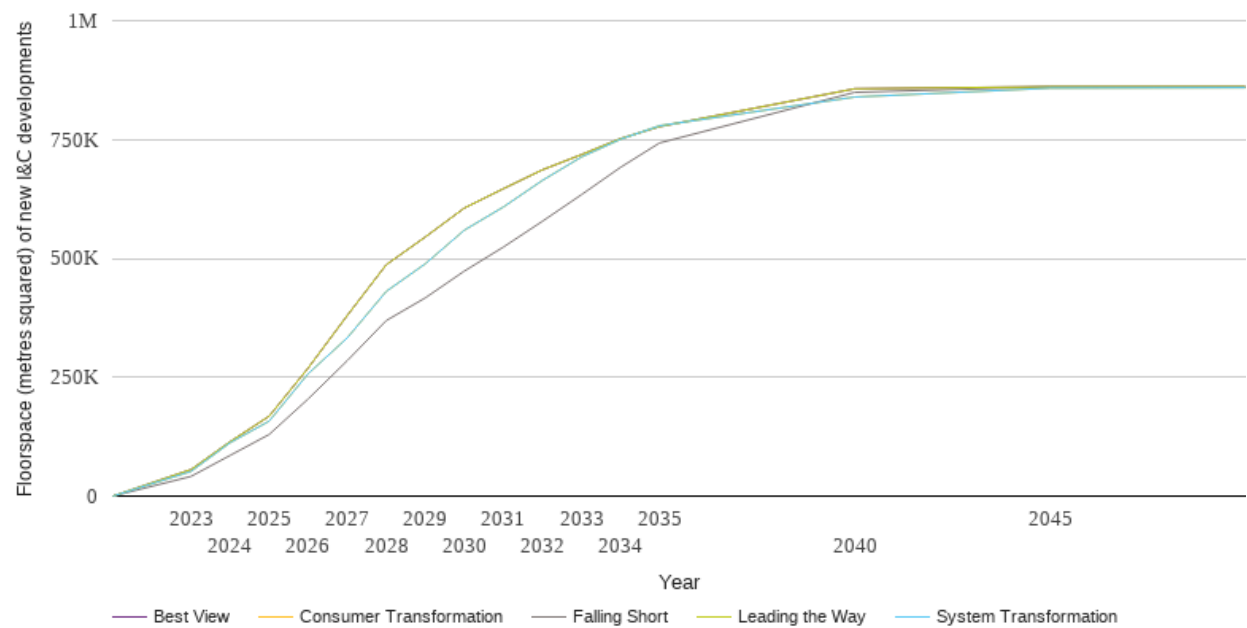
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	2.3	0.0	0.7	0.0
2027	0.0	5.3	0.8	1.5	0.0
2028	0.0	7.7	1.4	2.7	0.0
2029	0.3	10.6	2.1	4.0	0.3
2030	0.3	12.9	2.1	5.0	0.3
2031	0.3	15.4	2.7	5.5	0.3
2032	0.8	19.2	4.8	10.7	0.8
2033	0.8	25.1	10.5	11.8	0.8
2034	0.8	28.1	14.0	13.9	0.8
2035	1.3	31.8	18.7	19.5	1.3
2040	1.3	55.7	47.5	33.7	1.3
2045	1.3	111.3	79.0	99.4	1.3
2050	16.5	165.7	120.2	176.5	16.5



# Technology Summary: Non domestic

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

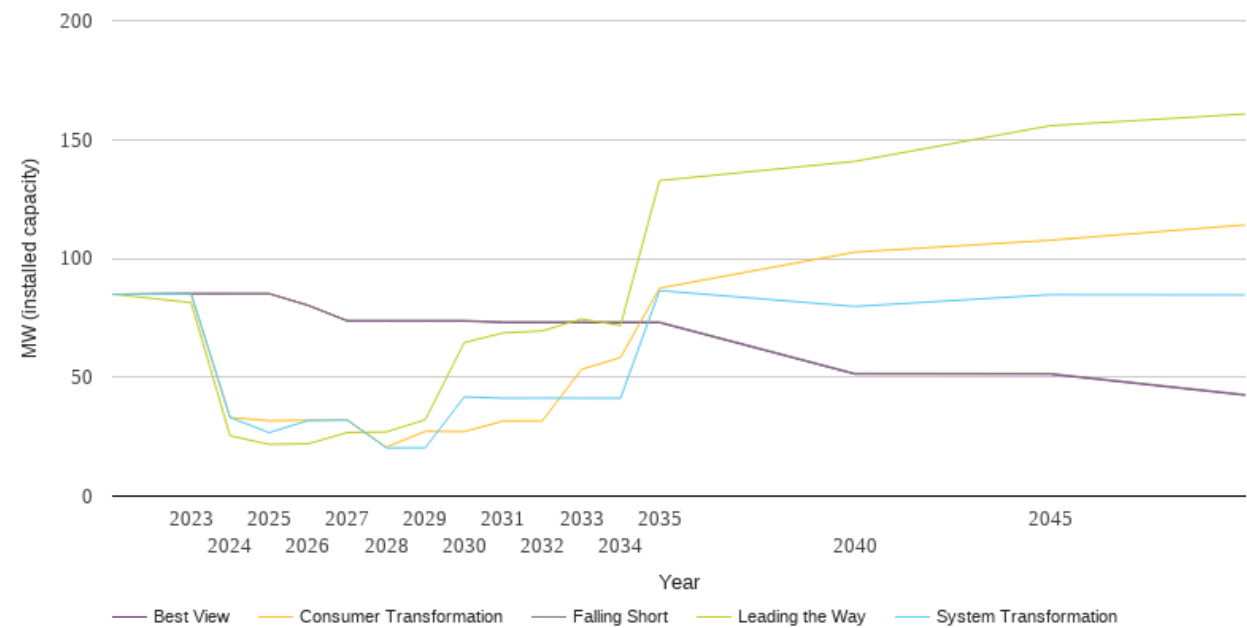
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	41406	51924	51924	55830	55830
2024	85521	112167	112167	114428	114428
2025	129564	157661	157661	168022	168022
2026	204368	257419	257419	269370	269370
2027	284742	332660	332660	379744	379744
2028	369154	430551	430551	486653	486653
2029	416954	488653	488653	545002	545002
2030	473259	559314	559314	605848	605848
2031	523780	608069	608069	646580	646580
2032	578026	663985	663985	686280	686280
2033	633996	713290	713290	718282	718282
2034	691460	750504	750504	751897	751897
2035	742841	779008	779008	777124	777124
2040	849264	839423	839423	856770	856770
2045	861109	858079	858079	861109	861109
2050	861109	859066	859066	861109	861109



# Technology Summary: Other Distributed Generation

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

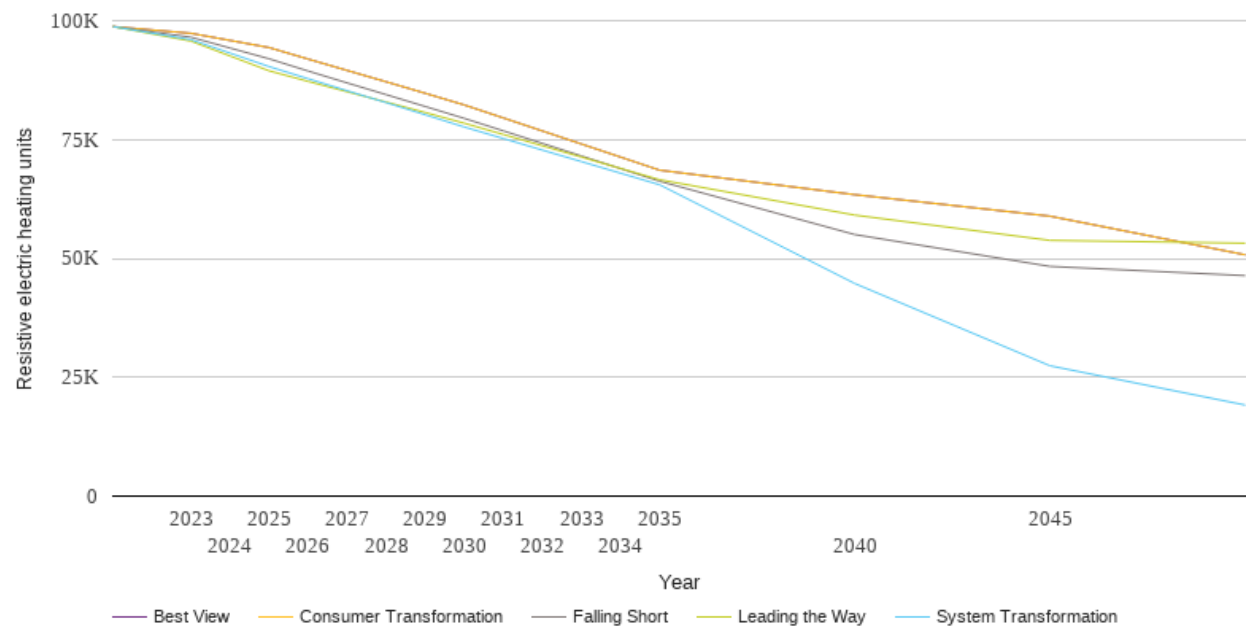
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	84.9	84.9	84.9	84.9	84.9
2023	85.1	85.1	85.1	81.4	85.1
2024	85.2	33.1	33.1	25.4	85.2
2025	85.2	26.7	31.7	21.8	85.2
2026	80.2	31.8	31.9	22.0	80.2
2027	73.9	31.9	32.2	26.8	73.7
2028	73.9	20.3	20.6	27.0	73.6
2029	73.9	20.3	27.3	32.1	73.6
2030	73.9	41.8	27.1	64.6	73.6
2031	73.2	41.2	31.6	68.7	73.0
2032	73.2	41.2	31.7	69.5	73.0
2033	73.2	41.2	53.3	74.5	73.0
2034	73.2	41.2	58.3	71.7	73.0
2035	73.2	86.5	87.5	132.7	73.0
2040	51.6	79.8	102.6	140.8	51.3
2045	51.6	84.7	107.6	155.8	51.3
2050	42.7	84.6	114.1	160.8	42.4



# Technology Summary: Resistive electric heating

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

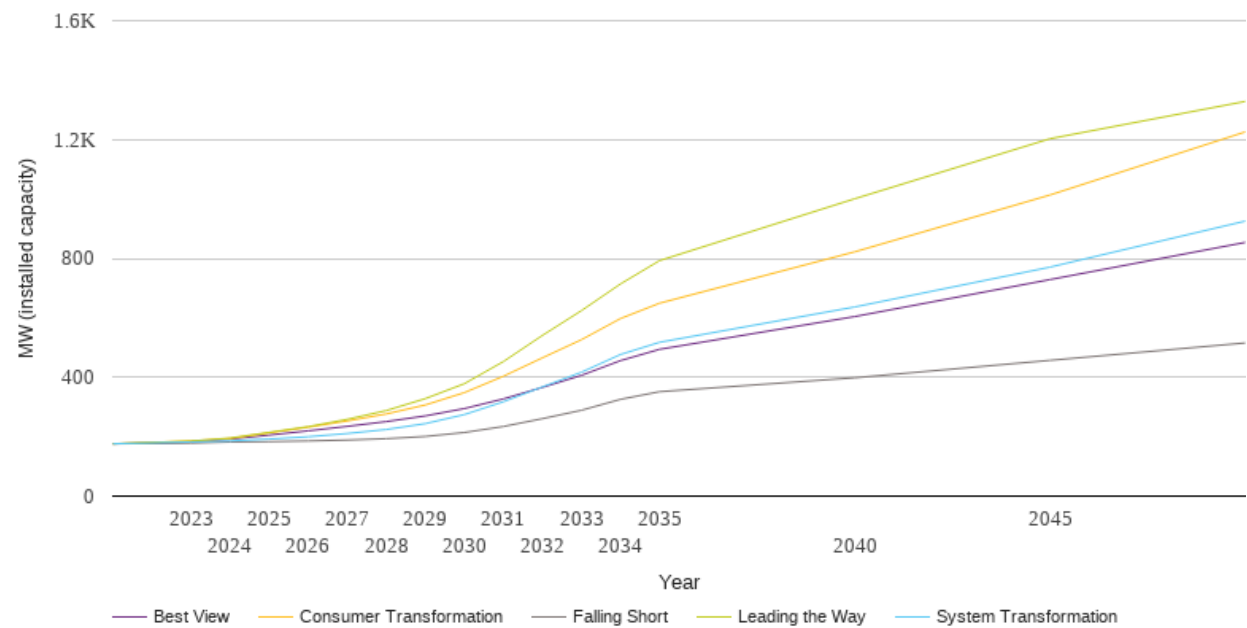
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	98761	98761	98761	98761	98761
2023	96519	96007	97341	95704	97341
2024	94247	93182	95850	92573	95850
2025	91981	90348	94343	89453	94343
2026	89411	87789	91921	87232	91921
2027	86908	85263	89528	85054	89528
2028	84439	82756	87140	82880	87140
2029	81949	80210	84727	80677	84727
2030	79450	77629	82274	78437	82274
2031	76829	75210	79542	76061	79542
2032	74185	72778	76798	73689	76798
2033	71544	70356	74059	71313	74059
2034	68896	67929	71311	68923	71311
2035	66235	65492	68560	66547	68560
2040	55012	44720	63399	59106	63399
2045	48317	27412	58881	53788	58881
2050	46374	19148	50754	53202	50754



# Technology Summary: Solar Generation

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

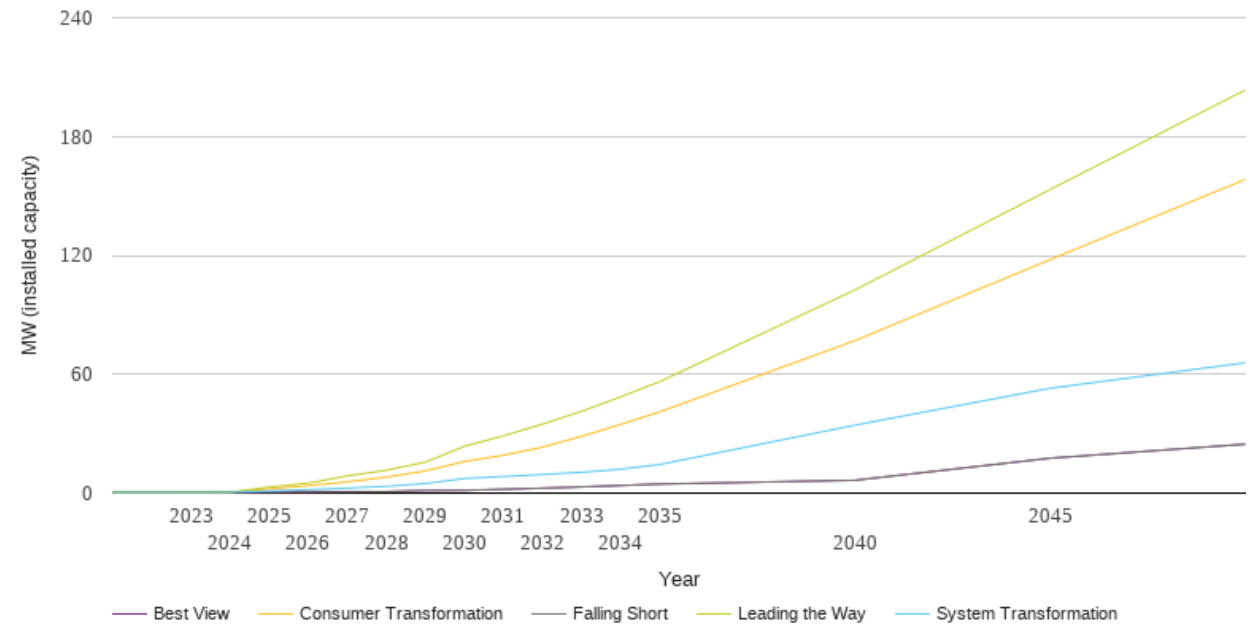
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	175.9	175.9	175.9	175.9	175.9
2023	178.3	182.2	185.1	185.3	182.3
2024	182.1	185.8	193.8	195.3	191.7
2025	183.3	192.0	212.7	214.3	205.3
2026	185.5	199.7	231.9	233.7	219.6
2027	188.6	210.6	252.8	258.3	234.7
2028	193.2	224.1	276.4	287.9	250.7
2029	200.7	243.9	306.6	328.0	269.8
2030	214.0	274.3	348.2	378.2	294.5
2031	234.2	317.4	403.3	452.7	327.1
2032	260.6	367.5	465.4	540.8	365.9
2033	288.8	416.9	526.4	624.2	406.4
2034	325.6	476.5	597.6	714.0	455.9
2035	351.3	517.6	649.1	792.5	493.9
2040	398.2	636.5	822.1	1000.7	604.2
2045	456.8	770.5	1013.3	1202.8	728.7
2050	515.4	925.5	1225.6	1328.2	853.7



# Technology Summary: Storage

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

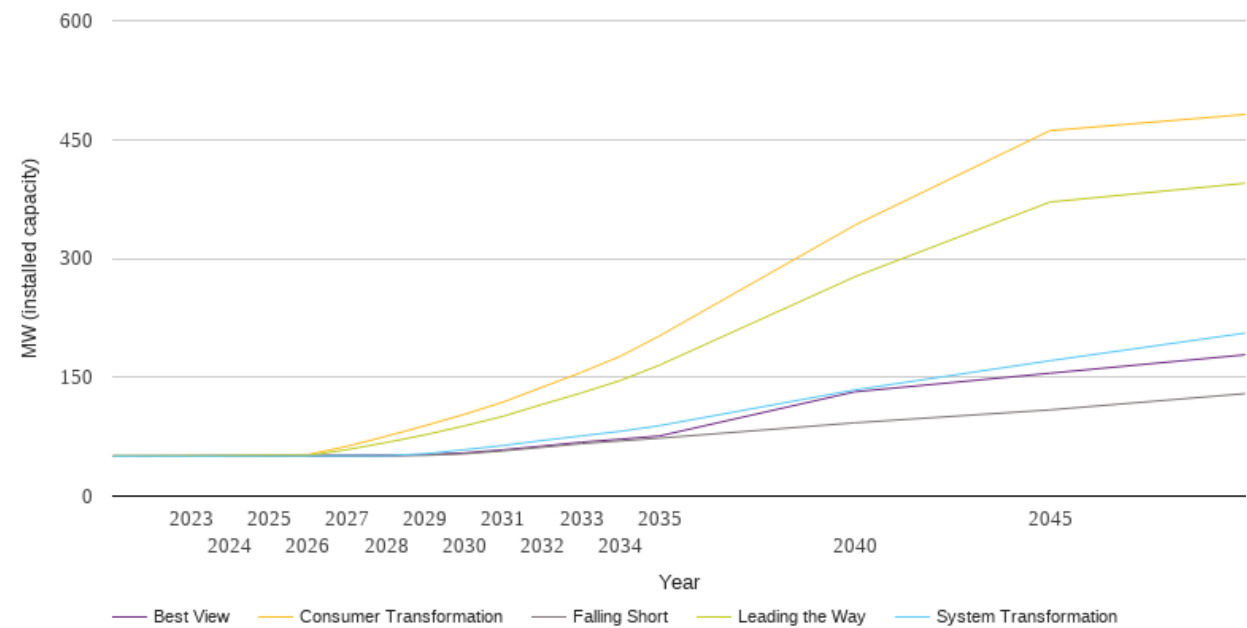
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.3	0.3	0.3	0.3	0.3
2023	0.3	0.3	0.3	0.3	0.3
2024	0.3	0.5	0.5	0.5	0.3
2025	0.6	1.0	2.1	3.0	0.6
2026	0.6	1.7	3.7	5.0	0.6
2027	0.7	2.5	5.7	8.7	0.7
2028	0.8	3.4	8.0	11.5	0.8
2029	1.3	4.8	11.2	15.6	1.3
2030	1.4	7.4	16.0	23.6	1.4
2031	1.9	8.3	19.1	28.9	1.9
2032	2.5	9.4	23.2	34.8	2.5
2033	3.1	10.5	28.7	41.3	3.1
2034	3.8	12.0	34.6	48.5	3.8
2035	4.6	14.4	41.0	56.2	4.6
2040	6.5	34.3	76.9	102.5	6.5
2045	17.6	52.9	117.8	153.2	17.6
2050	24.7	65.8	158.3	203.5	24.7



# Technology Summary: Wind

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

Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	50.5	50.5	50.5	50.5	50.5
2023	50.5	50.5	50.9	50.6	50.6
2024	50.5	50.6	51.3	50.7	50.7
2025	50.5	50.7	51.8	50.9	50.9
2026	50.6	50.8	52.3	51.0	51.0
2027	50.7	50.9	62.8	58.6	51.2
2028	50.8	51.0	75.4	67.7	51.5
2029	51.5	53.4	89.0	77.4	52.4
2030	53.4	58.5	103.2	88.6	54.4
2031	57.1	63.8	118.8	100.8	58.4
2032	61.5	70.2	137.5	115.8	63.1
2033	66.1	75.9	156.2	130.3	68.0
2034	69.6	81.8	176.5	145.9	71.8
2035	73.1	88.9	202.2	165.3	75.9
2040	92.5	134.0	341.9	276.7	131.6
2045	108.8	170.8	461.2	371.1	155.1
2050	129.3	205.7	481.7	394.9	178.3





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