

Global States and Regions Annual Disclosure Update 2018

Annex | December 2018

Projected Impact of Disclosed Targets

The purpose of this analysis is to estimate the annual decarbonization rate of states and regions disclosed targets and compare it with the decarbonization rate required for a 2°C scenario. The projected impact of disclosing states and regions was calculated by estimating the annual carbon intensity (tCO₂/\$m GDP) between 2010 to 2050 following the steps described below.

The projections use reported data on current region-wide GHG emissions, current GDP and future targets on region-wide emissions. Due to availability of data, a total of 50 states and regions were included in the analysis.

Step 1: GDP projections

- The first step of the analysis was to find historic (back to 2010) and projected GDP figures (up to 2050) for each state and region.

Methodology and assumptions:

- Disclosed historic and current GDP figures were used and complemented with online resources¹ to fill missing gaps. Otherwise, Compound Annual Growth Rates (CAGRs) were used to extrapolate between available data points.
- Where states and regions had not provided future GDP figures, these were projected forwards using projections of GDP growth rates at national level.
- All GDP figures were converted from local to current international dollars, using the World Bank PPP conversion factor².

Step 2: Emissions projections

- The second step was to input region-wide GHG emissions from 2010 until the latest inventory year.

Methodology and assumptions:

- Using Compound Annual Growth Rates (CAGR), an emissions pathway was projected from the latest inventory year to the target year(s), with the assumption that states and regions would meet their disclosed targets.
- Disclosed region-wide GHG emissions were used and complemented with online resources to fill missing gaps. Compound Annual Growth Rates (CAGRs) were used for extrapolations to fill remaining data gaps.

¹ PwC's 'World in 2050' analysis

² World Bank PPP conversion factors

Step 3: Calculating carbon intensity

- The third step was to calculate the collective carbon intensity of states. The sum of the emissions in each year was divided by the sum of GDP in each year. This gives a carbon intensity projection that can be directly compared with the PwC pathways.

Methodology and assumptions:

- As states and regions have different target end dates, the emissions and GDP figures for each state and region were only included in the total up until the target end year.
- Where analysis was undertaken at a country level, e.g. calculating the collective carbon intensity of the eight US states and regions, the same calculation approach was used but only including the states and regions in that country.
- This gives a carbon intensity projection that can be directly compared with the PwC Low Carbon Economy Index³ pathways.

Step 4: Comparison against PwC Low Carbon Economy Index pathways

- The fourth and final step compares the carbon intensity of states and regions to 2050 with projections developed as part of analysis undertaken by PwC as part of the Low Carbon Economy Index (2018). These projections, which have been included in this report, are:
 - Global business as usual decarbonization rate from 2000 to 2017
 - The projected average decarbonization rate from the G20 countries' Paris Agreement pledges (NDCs)
 - The projected decarbonization rate required to remain within a 2°C carbon budget by 2100

TABLE 1: CARBON INTENSITY PROJECTIONS UNDER DIFFERENT PATHWAYS 2010-2050

Year	Historic decarbonization 2010-2017	Business as usual decarbonization 2017-2050	2°C pathway	NDC projection	States and regions target projections
2010	314.40				280.00
2015	279.31			281.50	228.91
2017	264.62	264.62	264.62	266.82	209.90
2020		253.55	216.82	246.21	186.08
2025		236.13	155.57	215.35	153.26
2030		219.91	111.62	188.35	122.85
2035		204.80	80.08	164.74	67.34
2040		190.73	57.46	144.08	48.69
2045		177.62	41.22	126.02	36.03
2050		165.42	29.58	110.22	25.15

³ PwC Low Carbon Economy Index

Annual Decarbonization Rate Required to Meet 2030 Targets

For regions on the bar graph which did not disclose 2030 targets, we have used targets beyond 2030 to extrapolate their projected decarbonization rate in 2030. Similar to the *Projected Impact of Disclosed Targets* graph, an annual decarbonization rate from 2017 to their target year beyond 2030 was calculated using a compound annual growth rate (CAGR). Assuming the decarbonization rate is constant in each year, the rate is used as the projected decarbonization rate in 2030. The table below indicates the states and regions who disclosed a target beyond 2030 which were used to calculate the CAGR, and subsequently used to calculate the projected 2030 decarbonization target.

TABLE 2: STATES AND REGIONS WHO DISCLOSED A TARGET BEYOND 2030

Region	Target Year
Washington	2035
Minnesota	2050
Sardinia	2050
Bavaria	2050
South Australia	2050
Wallonia	2050
North Rhine Westphalia	2050
Jalisco	2050
Scotland	2050
Oregon	2050
British Columbia	2050
Newfoundland and Labrador	2050
Wales	2050
Baden Wurttemberg	2050
Helsinki Uusimaa	2035

TABLE 3: REGION-WIDE GHG REDUCTION TARGETS

Key
Updated disclosure
New disclosure
Under 2 members

GOVERNMENT	BASE YEAR	2020	2025	2030	2040	2050
Base Year Emissions Goal						
Aland	2005			60%		
Amazonas	1990					80%
Andalusia	2005			25%		
Attica	2008	20%				
Australian Capital Territory	1990	40%	60%	75%	95%	100%
Baden Wurttemberg	1990	25%				90%
Basque Country	2005			30%		80%
British Columbia	2007					80%
California	1990			40%		80%
Cantabria	2005	10%		26%		
Catalonia	1990 & 2005	25% ⁴		40%	65%	100%
Connecticut	1990 & 2001	10% ⁵		45%		80%
Drenthe	1990	20%				
Helsinki-Uusimaa	1990				100% ⁶	
Huánuco	1990					80%
Jalisco	2014					50%
Jamtland	1990	50%		100%		
La Reunion	2011	10%				
Madeira	1990					80%
Minnesota	2005					80%
Navarra	2005	20%		45%		
New York State	1990			40%		80%
Newfoundland and Labrador	1990	10%				75%
North Rhine-Westphalia	1990	25%				80%
Northwest Territories	2005			30%		
Oregon	1990	10%				75%
Østfold County	2005	20%				
Quebec	1990	20%		38%		80%
Queensland	2005			30%		
Rhineland-Palatinate	1990	40%				

San Martín	1990					80%
Sao Paulo State	2005	20%				
Sardinia	1990					83%
Scotland	1990	42%				80%
South Australia	1990					60%
Thuringia	1990			70%	80%	95%
Ucayali	1990					80%
Vermont	1990			40%		80%
Wales	1990	40%				80%
Wallonia	1990	30%				80%
Washington	1990				25% ⁷	50%
Yucatan	2005			40%		

Base Year Intensity Goal	
Bavaria	Reduce intensity of region-wide emissions to under 2 tonnes of CO2 per capita by 2050
Canton of Basel-Stadt	Reduce intensity of region-wide emissions to 3.8 tonnes of CO2 per capita by 2020 ⁸
Canton of Basel-Stadt	Reduce intensity of region-wide emissions to 2,3 tonnes of CO2 per capita (50% of 1990) by 2035 ⁸
Canton of Basel-Stadt	Reduce intensity of region-wide emissions to 1 ton of CO2 per capita (80% of 1990) by 2050
Gujarat	Reduce the emissions intensity of GDP by 33%–35% by 2030 below 2005 levels
Rio de Janeiro State	Reduce intensity of region-wide emissions to 0.13 tonnes CO2e/R\$ 1,000 by 2030
Upper Austria	Reduce energy-related GHG emissions intensity by 25-33% by 2030
Upper Austria	Reduce energy-related GHG emissions intensity by 70-90% by 2050

Baseline Scenario Goal	
Azores	Reduce region-wide emissions by 38% in 2030 compared to a business-as-usual (BAU) scenario.
Brittany	Reduce region-wide emissions by 8% in 2020 compared to a business-as-usual (BAU) scenario.

⁴ Catalonia's 2020 target has a base year of 2005

⁵ Connecticut's 2020 target has a base year of 1990

⁶ Helsinki-Uusimaa's target has a target year of 2035

⁷ Washington's target has a target year of 2035

⁸ Canton of Basel-Stadt's target is equivalent to a 20% reduction on 1990 levels

Baseline Scenario Goal	
Madeira	Reduce region-wide emissions by 30% in 2030 compared to a business-as-usual (BAU) scenario.
Nordland	Reduce region-wide emissions by 30% in 2020 compared to a business-as-usual (BAU) scenario.

Fixed Level Goal	
California	Limit GHG emissions to 431 MMt CO ₂ e in 2020. The State has achieved this target. [6]
Queensland	Queensland aims to achieve net zero emissions by 2050
Washington	Limit GHG emissions to 88.4 MMtCO ₂ e by 2020 ⁹

TABLE 4: REGION-WIDE RENEWABLE ENERGY TARGETS

RENEWABLE ENERGY CONSUMPTION						
Government	2020	2025	2030	2035	2040	2050
Aland			60%			
Andalusia	25%					
Baden Wurttemberg	25%					80%
Basque Country			20%			40%
Brittany	28%					
Canton of Basel-Stadt						90%
Catalonia			50%			100%
Jamtland			100%			
Northwest Territories			40%			
Nouvelle-Aquitaine	32% ¹⁰					
Scotland			50%			
Thuringia					100%	
Vermont		25%		40%		90%

RENEWABLE ENERGY PRODUCTION				
Government	2020	2025	2030	2050
Abruzzo	19%			
Azores	35% ¹¹			
Cantabria	42%			
Canton of Basel-Stadt				80%

⁹ Equals a return of GHG emissions to 1990 levels

¹⁰ Nouvelle-Aquitaine's target is for 2021

¹¹ Azores' target is for 2019

RENEWABLE ENERGY PRODUCTION				
Government	2020	2025	2030	2050
Drenthe			40%	
Estado de Mexico		50%		
North Denmark Region				100%
Quebec			25%	
Queensland			50%	
Sao Paulo State	61%			
Yucatan	9% ¹²			

RENEWABLE ELECTRICITY CONSUMPTION				
Government	2020	2025	2030	2040
Aland			60%	
Australian Capital Territory	100%			
California	33%		50%	
Connecticut			40%	
Navarra			50%	
New Caledonia			100%	
New York State			50%	
Oregon				50%
Scotland	100%			
State of Virginia		15%		

RENEWABLE ELECTRICITY PRODUCTION			
Government	2020	2025	2030
Alberta			30%
Azores		61% ¹³	
Baja California	10%		
Bavaria		70%	
Gujarat			40%
La Reunion	100%		
Madeira	50%		
Minnesota			50%
Washington	15%		

¹² Yucatan's target is for 2018

¹³ Azores' target is for 2023

TABLE 5: REGION-WIDE ENERGY EFFICIENCY TARGETS

ENERGY EFFICIENCY TARGETS (AS A DECREASE IN ENERGY USE)			
Government	Percent decrease in energy use	Base year	Target year
Baden Wurttemberg	50%	2010	2050
Brittany	26%	2005	2020
Cantabria	17%	Trend scenario	2020
Catalonia	20%	Trend scenario	2020
	27%	¹⁴	2030
Lombardy	10%	2005	2020
Navarra	30%	Trend scenario	2020
	10%	Trend scenario	2025
	10%	Trend scenario	2030
New Caledonia ¹⁵	20%	2014	2030
	25%	2014	2030
North Denmark Region	20%	2012	2020
Nouvelle-Aquitaine	30%	2005	2021
Piedmont	27%		2030
Scotland ¹⁶	12%	2006	2020
Vermont	15%		2025
Wales	18%	2007	2020
Wallonia	18%	2007	2020

ENERGY EFFICIENCY TARGETS (AS AN INCREASE IN ENERGY EFFICIENCY)			
Government	Percent increase in energy efficiency	Base year	Target year
Basque Country	33%	2016	2030
Newfoundland and Labrador	20%	2007	2020
Piedmont	30%		2030
Quebec	15%	2013	2030
Upper Austria	1.5% to 2% per year	2014	2050

¹⁴ Law 16/2017, of 1 August, on Climate Change (Art. 19.1.a): Reduce final energy consumption almost 2% per year to achieve a minimum of 27% in 2030

¹⁵ New Caledonia's 20% target covers primary energy consumption while the 25% target covers final energy consumption

¹⁶ Scotland's near-term target is based on 2005-2007 levels

TABLE 6: GHG EMISSIONS TRENDS SINCE BASE YEAR

GOVERNMENT	BASE YEAR	LATEST INVENTORY YEAR	PERCENT CHANGE FROM BASE YEAR
Abruzzo	2006	2012	-18%
Acre ¹⁷	2010	2012	-73%
Aland	2005	2015	-31%
Andalusia	2005	2016	-26%
Attica	2008	2015	-25%
Australian Capital Territory ¹⁸	1990	2016-2017	23%
Azores	1990	2014	60%
Baden Wurttemberg	1990	2016	-12%
Basque Country	2005	2016	-26%
Bavaria	1990	2015	-14%
British Columbia	2007	2015	-5%
Brittany	2005	2010	-5%
California	1990	2016	0%
Cantabria	2005	2015	-20%
Catalonia	1990	2016	8%
Connecticut	1990	2014	-3%
Drenthe	1990	2016	-4%
Estado de Mexico	2010	2015	-22%
Helsinki-Uusimaa	1990	2015	-11%
Jalisco	2010 ¹⁹	2014	-32%
Jamtland	1990	2015	-37%
La Reunion	2011	2015	-3%
Lombardy	2005	2016	-20%
Lower Austria	2005	2016	-18%
Minas Gerais	2005	2014	24%
Minnesota	2005	2014	-4%
Navarra	2005	2016	-19%
New Caledonia	2014	2017	43%
New York State	1990	2015	-8%
Newfoundland and Labrador	1990	2016	15%
Nordland	2009	2016	4%
North Brabant	2010	2016	-2%
North Denmark Region	2010	2016	-15%
North Rhine-Westphalia	1990	2017	-25%
Northwest Territories	2005	2016	3%
Nouvelle-Aquitaine	1990	2016	2%

¹⁷ Inventário de Emissões Antrópicas e Sumidouros de Gases de Efeito Estufa do Estado do Acre¹⁸ ACT Greenhouse Gas Inventory for 2016-2017¹⁹ Plan Estatal de Acción Ante el Cambio Climático Jalisco

GOVERNMENT	BASE YEAR	LATEST INVENTORY YEAR	PERCENT CHANGE FROM BASE YEAR
Oregon	1990	2016	10%
Østfold County	2005	2016	-5%
Quebec	1990	2015	-9%
Queensland	2005	2015-2016	-15%
Rhineland-Palatinate	1990	2015	-37%
Rio de Janeiro State	2005	2015	40%
Sao Paulo State	2005	2016-2017	7%
Scotland	1990	2016	-49%
South Australia	1990	2015-2016	-20%
Thuringia	1990	2014	-61%
Upper Austria	1990 ²⁰	2016	3%
Vermont	1990	2015	16%
Wales	1990	2016	-14%
Wallonia	1990	2016	-36%
Washington	1990	2015	11%
Western Cape	2009	2015-2016	3%

TABLE 7: PROGRESS TOWARDS 2020 GHG REDUCTION TARGETS

GOVERNMENT	CURRENT INVENTORY YEAR	TARGET IN 2020	% TOWARDS 2020 TARGET	ANNUAL REDUCTION RATE NEEDED TO REACH 2020 ON TIME
Attica	2015	20%	124%	Target met or exceeded
Australian Capital Territory	2016-2017	40%	-56%	More than 4%
Baden Wurttemberg	2016	25%	48%	More than 4%
California	2016	Fixed level	100%	Target met or exceeded
Cantabria	2015	10%	198%	Target met or exceeded
Catalonia	2016	25%	95%	0.1-2%
Comunidade Intermunicipal do Médio Tejo	2014	23%	88%	0.1-2%
Connecticut	2014	10%	28%	0.1-2%
Drenthe	2016	20%	19%	More than 4%
Jamtland	2015	50%	73%	More than 4%
La Reunion	2015	10%	31%	0.1-2%
Navarra	2016	20%	96%	0.1-2%
Newfoundland and Labrador	2016	10%	-154%	More than 4%
North Rhine-Westphalia	2017	25%	100%	Target met or exceeded
Oregon	2016	10%	-102%	More than 4%

²⁰ Bundesländer Luftschadstoff- Inventur 1990—2016

GOVERNMENT	CURRENT INVENTORY YEAR	TARGET IN 2020	% TOWARDS 2020 TARGET	ANNUAL REDUCTION RATE NEEDED TO REACH 2020 ON TIME
Østfold County	2016	20%	26%	More than 4%
Quebec	2015	20%	44%	2-4%
Rhineland-Palatinate	2015	40%	94%	0.1-2%
Sao Paulo State	2016-2017	20%	-34%	More than 4%
Scotland	2016	42%	117%	Target met or exceeded
Wales	2016	40%	40%	More than 4%
Wallonia	2016	30%	122%	Target met or exceeded
Washington	2015	Fixed level		2-4%

TABLE 8: MITIGATION AND ADAPTATION ACTIONS

TOTAL NUMBER OF MITIGATION ACTIONS BY SECTOR AND REGION							
Regions	Oceania	North America	Latin America	Europe	Asia	Africa	Grand Total
Energy	41	129	80	274	29	14	567
Buildings and Lighting	36	119	53	255	34	39	536
Transport	29	84	28	195	7	20	363
Waste	24	79	42	159	9	20	333
Land Use	19	52	68	81	4	17	241
Governance	14	52	38	105	11	15	235
Industry	10	34	25	97	1	11	178
Finance and Economy	18	74	13	40	8	6	159
Agriculture	7	18	32	39	5	13	114
Water	7	19	7	31	3	9	76
Grand Total	205	660	386	1276	111	164	2802

TOTAL NUMBER OF ADAPTATION ACTIONS BY SECTOR AND REGION							
Sectors	Oceania	North America	Latin America	Europe	Asia	Africa	Grand Total
Buildings and Infrastructure		13	4	10		6	33
Community Engagement	2	7	6	8		1	24
Disaster risk management	4	24	15	38	1	12	94
Environment and Biodiversity		10	4	19		4	37
Planning and Policy		25	9	20		3	57
Public Health		4		1			5
Water	6	17	6	9		7	45
Grand Total	12	100	44	105	1	33	295