The EU's climate strategy needs a new assessment of ambition

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July 2018

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Summary

The European Commission has been tasked with producing a new long-term EU climate strategy, to be published later in 2018.

Since the last EU 2050 roadmap was published in 2011, the context has changed in three fundamental ways:

1. Costs of early climate action have declined dramatically.
2. Climate action is increasingly international, leading to new opportunities for cooperation but also new challenges for Europe's competitiveness.
3. Climate goals have strengthened, as the risks of even small amounts of warming become more evident.

In light of these changes, a new assessment of Europe's decarbonisation pathway to both 2030 and 2050 is needed. A strengthened pathway can drive both better decisions within Europe and greater ambition internationally.

Recent political decisions have given a new impetus for long-term climate strategies

The EU last produced a 2050 climate roadmap in 2011. This is now widely considered to be out of date, as a result of both its cost assumptions and its level of ambition.

Following recent political decisions, **the EU is developing a new long-term climate strategy**, with an initial proposal expected from the Commission in late 2018.

European member states will also develop their own 2050 climate plans, to be produced by 2020.

These new climate strategies will need to take into account the radical changes in context since the last EU climate roadmap was published, and develop a new assessment of climate ambition for both 2030 and 2050.

Paris Agreement: "all Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies" by 2020

The **European Council** "invites the Commission to present by the first quarter of 2019 a proposal for a strategy for long-term EU greenhouse gas reductions in accordance with the Paris Agreement, taking into account the national plans"

Governance regulation: the EU long-term strategy should include "a scenario on achieving net zero GHG emissions within the Union by 2050 and negative emissions thereafter"; member states should develop their own 2050 strategies by 2020

1. Costs of early climate action have declined dramatically

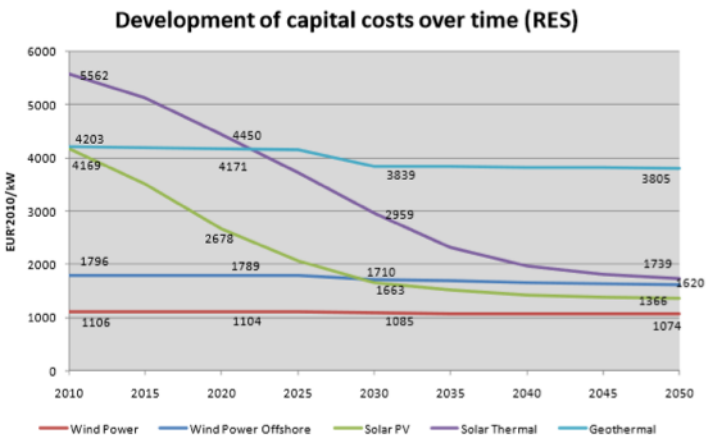
Renewables costs have fallen far faster than forecast

The previous EU 2050 roadmap foresaw a 67% fall in the capital cost of solar PV and a 3% drop in the capital cost of onshore wind by 2050.

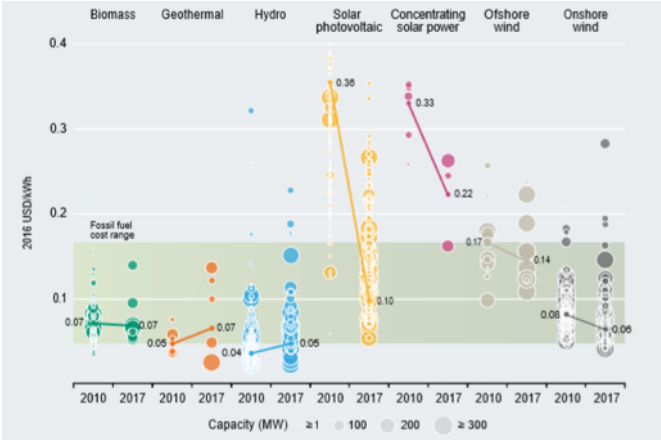
In reality, cost reductions for wind and solar have been far steeper than forecast.

By 2017, the **projected capital cost reductions for 2050 have already been exceeded** for onshore wind (-20%) and solar PV (-68%).

The previous EU 2050 roadmap projected only gradual cost reductions for wind and solar



In reality, costs have fallen far more steeply than forecast, according to the latest IRENA data.



As a result, Europe's cost-effective pathway for 2030 involves higher levels of renewables

The radical cost reductions in renewable energy means that the most cost-effective pathway for Europe involves **considerably higher renewable energy deployment** than previously modelled.

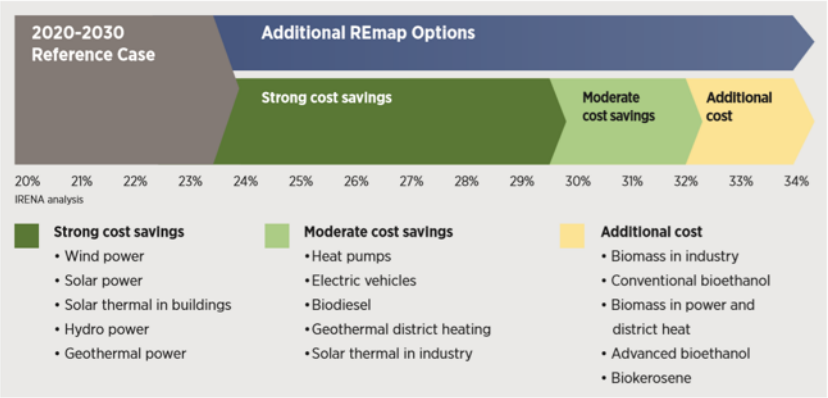
In contrast to the previous 27% renewable energy target, IRENA identifies a **cost-effective renewable energy share of 34%** by 2030.

Cost-effective renewables alone would create 420 Mt in CO2 savings below the baseline, taking the EU beyond the 40% GHG target.

In June 2018, **the EU agreed a new renewable energy target of 32% by 2030, with option of an upward revision in 2023.**

The International Renewable Energy Agency shows the EU can reach 34% renewables by 2030 on a cost effective basis

Renewable energy options to exceed the 27% target for 2030



Cost-effective energy efficiency potentials are also higher than foreseen

Previous EU projections foresaw gradual improvements in energy efficiency, reaching 27% below the baseline by 2030.

More granular analysis shows the cost-effective efficiency potential is much higher, reaching 38% below the baseline by 2030.

This delivers **deeper GHG emissions reductions – reaching 45% by 2030** – even without factoring in increases in renewables or changes to the fuel mix.

A failure to access this cost-effective potential would increase costs for Europeans.

In June 2018, **the EU agreed a new energy efficiency target of 32.5% by 2030, with the option of an upward revision in 2023.**

Analysis by Fraunhofer ISI shows significantly higher low-cost energy efficiency potential than previously projected

PRIMES 2013 update			PRIMES 2013		PRIMES 2013	
Calculated value						
Input parameter	1990	2005	2020 Reference Development	2020 targets Based on sector EE potentials	2030 Reference Development	2030 targets Based on sector EE potentials
Important calculated values						
GDP (in 000 MEuro'10)	8597	11722	14190		16600	100%
GDP growth/a (compared to 1990)		2.09%	1.58%		1.56%	
Final energy saving ambition compared to PRIMES 2013 baseline				5.3%		21.7%
Final energy demand (ktoe)	1074238	1184339	1130486	1070528	1118669	875842
Industry	365389	328869	304635	294212	305330	265891
Residential	272133	309867	297387	288147	295351	208198
Tertiary	153840	178847	171626	177210	166207	134297
Transport	282868	366756	356837	310959	351781	267457
Final energy intensity (toe/MEuro'10)	125	101	80	75	67	53
Final electricity demand (ktoe)	184877	238176	254202	240720	274025	249623
Industry	84908	97143	95838	90755	95131	85618
Residential	52018	69266	73244	69358	82437	74194
Tertiary	42527	65776	77438	73331	85771	77194
Transport	5424	4721	6261	5928	9094	8184
Gross inland consumption	1658551	1824307	1656059	1541693	1602873	1252872
Non-energy use	97182	120003	121702	121702	120958	120958
Primary energy demand (ktoe)	1561369.8	1704304	1534357	1419991	1481915	1131914
Primary energy saving ambition compared to PRIMES 2013 baseline				7.5%	79%	23.6%
of which primary savings from final demand savings				-3.8%		-22%
of which primary savings from conversion savings				-3.7%		-2%
Primary energy intensity (toe/MEuro'10)	182	145	108	100	89	68
compared to PRIMES 2013 baseline				7.5%		23.6%
% RE in gross final energy demand	na	8.4%	20.9%	20.9%	24.4%	26.5%
% RE in gross electricity demand		14.7%	35.2%	35.2%	42.6%	44.0%
of which renewables with 100% conversion efficiency		80.0%	80.0%	80.0%	80.7%	80.7%
%RES-T, transport as in Article 3(4)a (3)		1.3%	10.3%	10.3%	12.0%	13.0%
%RES-H (calculated)		9.9%	20.6%	20.0%	22.3%	23.0%
%RES-H (as provided)		10.1%	21.5%		23.8%	
Overall RES		103196	244683	232019	284788	242311
RES-H		57766	108179	104953	111837	85103
RES-E		41549	106487	100833	138978	129132
of RES-E with 100% efficiency		33239	85191	80666	112177	104229
RES-T		3882	30017	26233	33972	28076
Sum		103196	244683	232019	284788	242311
GHG Emissions compared to 1990 (MtCO2-eq.)			-23.4%	-27.6%	-31.5%	-45.4%
Total GHG Emissions	5574	5292	4272	4034	3820	3042
Other GHG emissions (non-energy related CO2, Non-CO	1502	1174	1023	1023	989	989
CO2 emissions compared to 1990 (MtCO2)			-32.0%	-35.2%	-33.6%	-49.2%
CO2 emissions (energy-related)	4109	4118	3249	3010	2860	2082
Power generation	1425	1478	1042	933	789	503
Energy branch	231	172	138	131	124	97
SUM End use	2452	2468	2068	1947	1949	1483
Industry	781	637	505	496	482	401
Residential	499	489	391	384	358	219
Tertiary	301	265	194	216	158	109
Transport	813	1077	978	850	951	699

The new EU energy efficiency and renewables targets imply deeper emissions cuts

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Taken together, the new EU targets for energy efficiency and renewables should lead to the **EU significantly outperforming its current 2030 greenhouse gas target of -40%.**

This means **the EU is already in a position to signal to international partners that it is willing to review its 2030 climate commitment** under the Paris Agreement.

However the **opportunity to deliver deeper greenhouse gas reductions goes beyond renewables and energy efficiency alone**: a close assessment will also need to be made of new developments in other sectors.

European Commission modelling from 2017 suggests that the new targets of 32% renewable energy and 32.5% energy efficiency will lead to GHG cuts of approximately 45% by 2030

	2016 Impact Assessment	2017 modelling exercise (updated RES technology costs)				
Costs/Benefits	27%RES/30%EE (EUCO30)	27%RES/30%EE	30%RES/30%EE	33%RES/33%EE	35%RES/35%EE	45%RES/40%EE
GHG emissions reductions in 2030 (compared to 1990 – in %)	-40.8%	-40.8%	-43%	-45.8%	-47.5%	-53.2%
GHG emissions reductions in ETS sector (compared to 2005 - in %)	-43.1%	-43.2%	-46.5%	-48.7%	-50.1%	-58.4%
GHG emissions reductions in non-ETS sector (compared to 2005 - in %)	-30.3%	-30.3%	-31.7%	-35.5%	-37.7%	-41.9%

** The 2016 Impact assessment used 27%RES/30%EE in the modelling run to effectively approximate the CE4AE package*

In addition, Europe is moving away from coal more quickly than foreseen, leading to even faster emissions cuts

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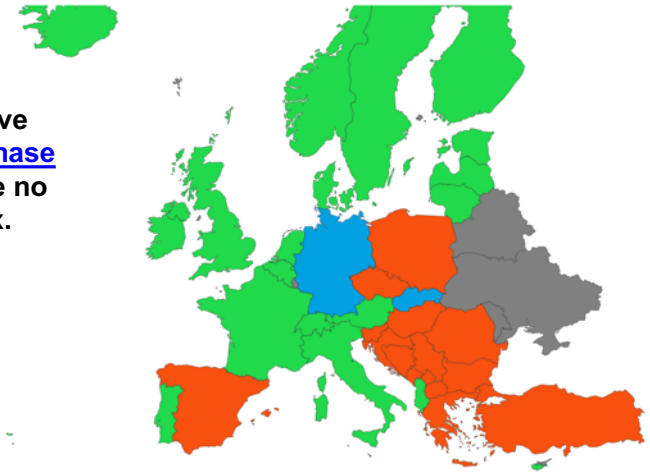
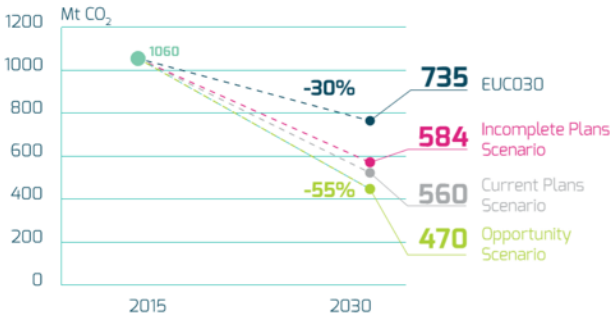
An increasing number of countries – including France, Italy and the UK – have announced commitments to phase out coal by 2030 or earlier. Overall, 17 EU countries either have no coal plant or have committed to coal phaseouts.

Others, such as Germany, are discussing significant reductions in coal by 2030.

This means faster emissions reductions. Scenarios based on current commitments show **up to 55% emissions reductions in the power sector by 2030**.

17 countries have [committed to phase out coal](#) or have no coal in their mix.





[Energy Union Choices study](#): Already-announced coal phaseout pledges - combined with updated renewables costs and developments in demand flexibility – mean 55% lower power sector emissions by 2030 compared to 2015. This is 36% lower than previous EU projections.

New technologies and business models offer even greater opportunities

Accelerated cost reductions have also been seen other low carbon technologies including batteries, sensors, LEDs and advanced materials.

Disruptive innovation from **digitalisation, automation, machine learning, electrification and new circular economy approaches and business models** all offer the prospect of far greater efficiency savings and emissions reductions.

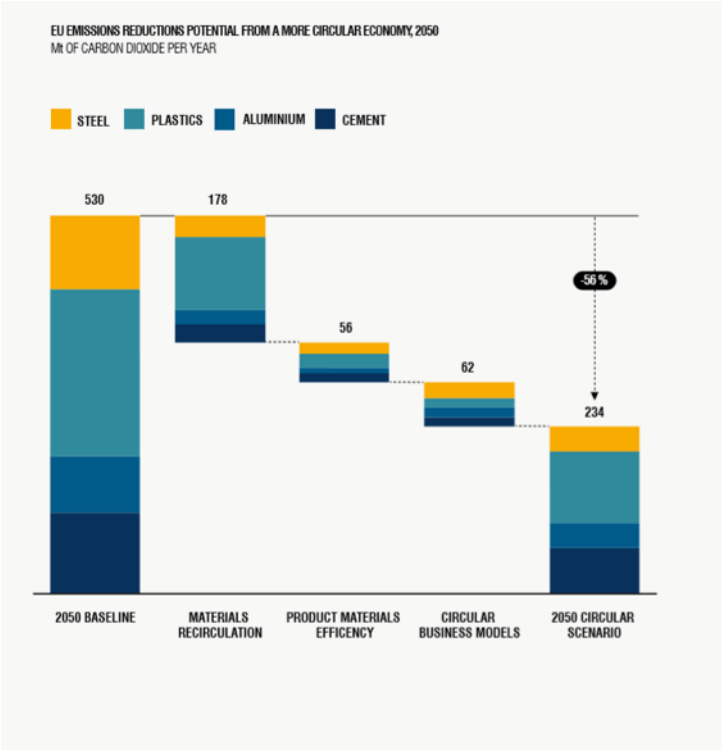
These economic shifts have not been fully captured in previous modelling exercises.

In key industrial sectors, new circular economy approaches offer the potential for deep emissions reductions

Industrial models in Europe are changing, with increasing recognition of the value of new techniques such as recirculation of materials, more efficient materials use in products, and new business models that enable higher utilisation rates of products (the 'sharing economy).

While these techniques create value in their own right, they also create a significant climate dividend: analysis suggests these techniques alone could halve industrial emissions in key sectors by 2050.

New approaches such as materials recirculation, product materials efficiency and circular business models could reduce industrial emissions by 56%, a new study from Material Economics finds



2. Climate action is increasingly international, leading to new opportunities for cooperation but also new challenges for competitiveness.

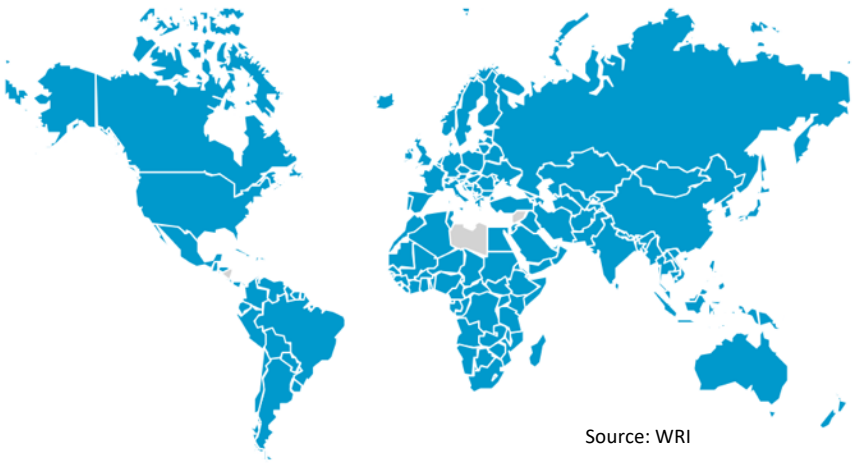
Since the last EU 2050 roadmap was published, countries across the world have committed to climate action

The previous EU 2050 Roadmap was published in 2011.

Since then, 192 countries have submitted climate pledges, and the Paris Agreement provides a clear international framework for ratcheting up climate action.

This means there are new opportunities for higher EU climate ambition to leverage stronger ambition internationally.

192 countries have submitted climate pledges as part of the Paris Agreement



Source: WRI

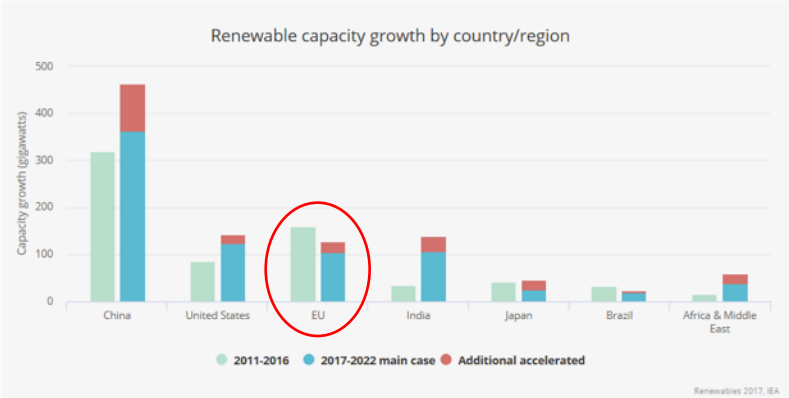
This new reality comes with new competitiveness challenges

As more countries enter the low carbon transition, Europe's early leadership position in the low carbon economy is being challenged.

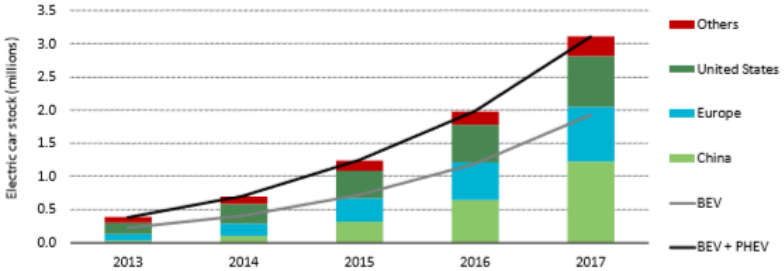
In areas such as renewable power and electric transport, growing international demand for low carbon technologies mean that Europe is no longer the market leader.

Europe's new climate strategy is an opportunity both to re-energise EU markets in clean technologies and to safeguard European competitiveness in a rapidly-decarbonising world.

In contrast to the growth seen in major competitors, Europe's deployment rate of renewables is expected to shrink over the next 5 years, the IEA project



Europe's electric vehicle market faces challenges from China and the US, IEA figures show

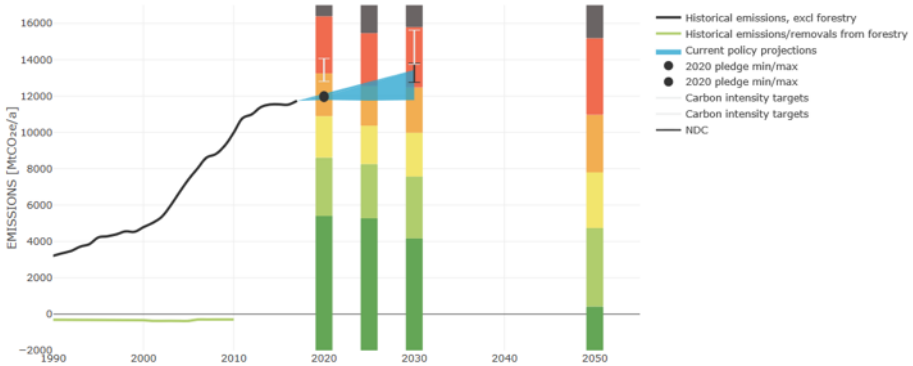


Like Europe, major economies such as China and India will overshoot their climate targets

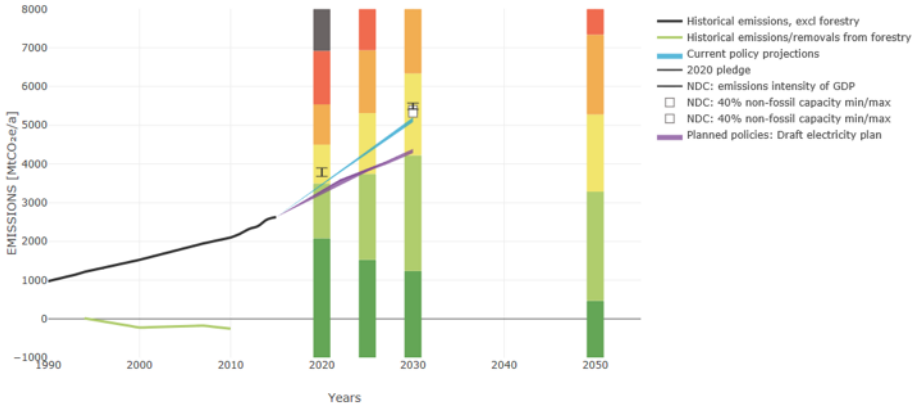
The falling cost of climate action means the EU is on track to significantly overachieve its 2020 and 2030 climate targets.

These falling costs also open up new opportunities for faster action across the world. Like Europe, other major economies such as China and India are on track to overachieve their Paris Agreement pledges.

Strengthened EU climate ambition can be used as a level to encourage stronger climate pledges internationally.



Proposed policies in China (above) and India (below) would take both countries past their current 2030 climate targets (source: Climate Action Tracker)



The next 30 months offer important opportunities to strengthen global climate ambition

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2018

1.5ºC report

In September 2018, the Intergovernmental Panel on Climate Change will publish a **special report on the benefits of keeping global warming to 1.5ºC** and potential pathways to achieve this aim.

2018

Stocktake of action

The 'Talanoa Dialogue' that concludes in December 2019 will provide stocktaking of efforts to mitigate climate change. This is likely to identify that **current pledges are insufficient to reach the agreed objective of keeping global warming to well below 2ºC** or the aim of limiting warming to 1.5ºC.

2020

Long-term strategies

By 2020, all countries are requested to **develop long-term low GHG development strategies**, under the terms of the Paris Agreement. Europe's new climate strategy can be a model for other countries to follow.

2020

New 2030 pledges

In 2020, countries need to submit **new or updated climate pledges for 2030**. A commitment from the EU to go further than its previous pledge can help unlock higher ambition from other countries.

3. Climate goals have strengthened, as the risks of even small amounts of warming become more evident

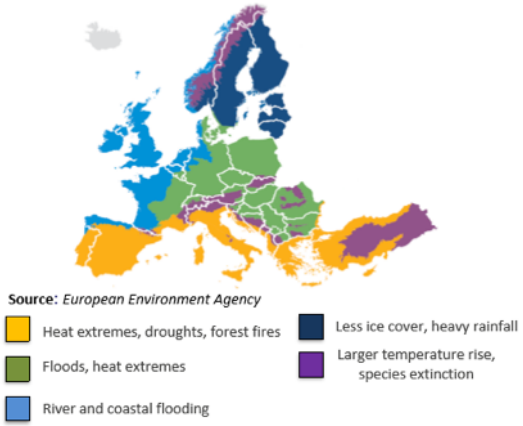
Even small levels of warming have negative impacts that put Europe's prosperity at risk

By 2018 **the world has already warmed by 1°C** above the pre-industrial average.

This is already leading to climate impacts including heatwaves, droughts, fires, storms and floods. These impacts affect Europe both directly and indirectly – e.g. through disrupting supply chains and food systems and inducing migration.

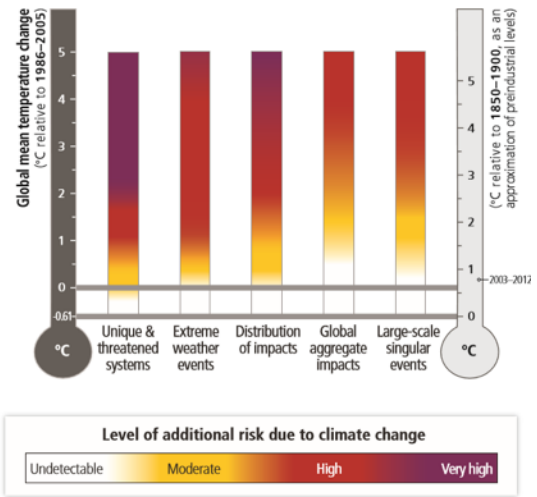
A 2°C limit is not 'safe' – but involves additional risk of extreme weather and disruption to natural and human systems.

Each fraction of a degree of temperature rise avoided contributes to reducing the most severe climate risks and impacts.



Climate impacts are already affecting all of Europe, as seen shown by [European Environment Agency assessments](#).

The [Intergovernmental Panel on Climate Change](#) identifies that even 2°C of warming leads to high additional risk of extreme weather and disruption to food production, ecosystems and water supply.



Going beyond 1.5°C significantly increases risks of irreversible climate tipping points

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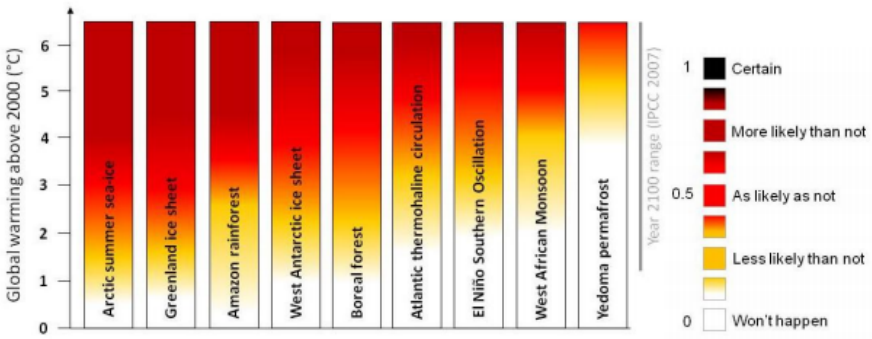
Higher temperatures pose the **risk of crossing critical thresholds leading to abrupt and irreversible changes**.

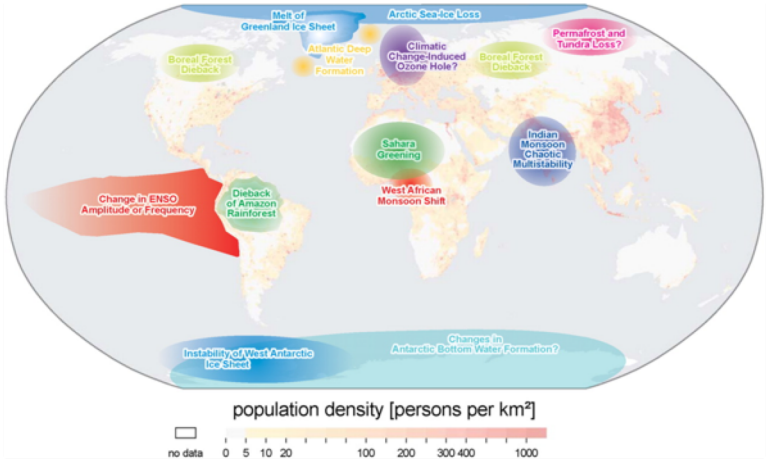
Near-term risks include melting of ice sheets, collapse of coral reefs, increased likelihood of extreme weather events, ocean acidification, sea level rise, and longer and more intense heat waves.

Some of these tipping points – such as melting permafrost and forest diebacks – create positive feedback loops that would accelerate climate change even faster.

Accelerated early efforts to limit global temperature rise will be critical for avoiding the most serious tipping point risks.



Risks of crossing tipping points greatly increase with higher temperatures, as highlighted in Nature (above) and PNAS (below)



Timothy M. Lenton et al. PNAS 2008;105:6:1786-1793

PNAS

The Paris Agreement strengthened EU and international climate goals

In light of the evidence on climate risk, in 2015 the Paris Agreement agreed stronger goals on climate change.

The Agreement replaced the previous 2°C temperature goal with a new commitment to **limit temperature rises to "well below 2°C" and to pursue efforts to limit global warming to 1.5 °C.**

In recognition of the fact that current climate commitments are not yet in line with this temperature goal, signatories agreed to progressively increase commitments over time.

Article 2

1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

(a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

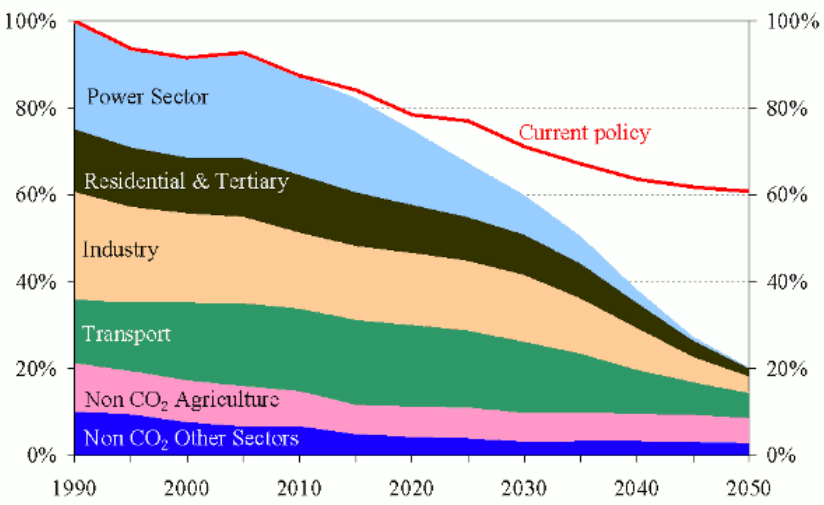
The previous 2050 roadmap does not reflect the new climate goals

In 2009 the EU set an objective of achieving 80%-95% GHG emissions reductions by 2050, following the IPCC's Fourth Assessment Report in 2007. This range was based on a goal of keeping global warming to 2°C.

The EU's last 2050 roadmap (published in 2011) only looked at the lowest end of this 80-95% range.

As a result, the previous 2050 Roadmap is **not consistent with the objectives in the Paris Agreement to keep warming to 'well below 2°C' and to aim for 1.5°C.**

The European Commission's previous Roadmap to a Low Carbon Economy in 2011 only looked at an 80% GHG reduction by 2050 – a goal now considered out of date.



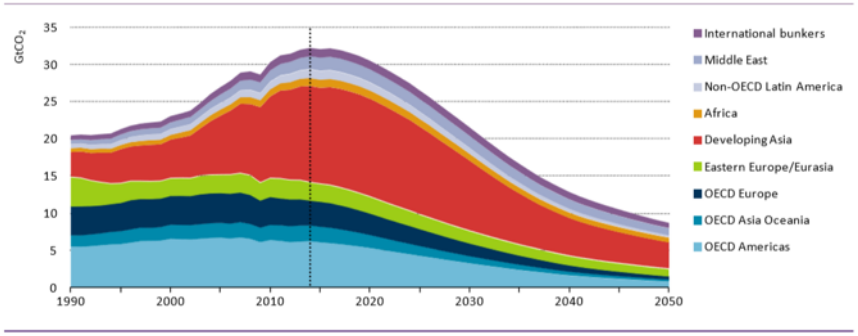
To meet global climate objectives, the EU needs to reach net zero emissions by 2050 at the latest

Recent analysis shows that EU CO2 emissions need to approach zero by 2050 in order to keep open a good chance of keeping global warming below 2 degrees.

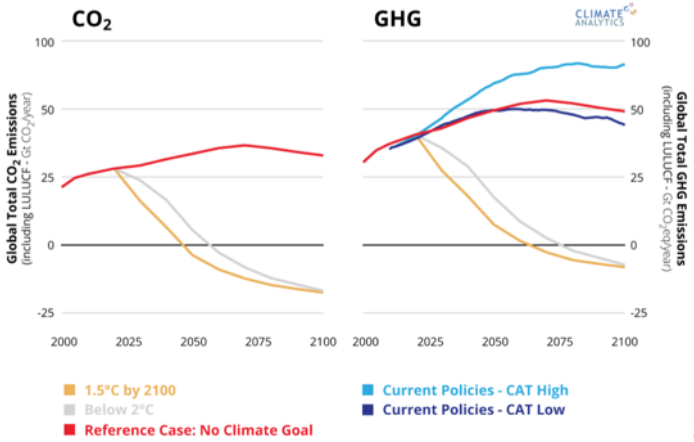
Even steeper reductions would be needed for "well below 2°C" and 1.5°C scenarios to remain viable. Global net zero emissions by around 2060 would be needed to keep global warming to 1.5°C, with Europe getting to zero even faster.

The forthcoming IPCC special report on 1.5°C will highlight potential global pathways for meeting the 1.5°C and "well below 2°C" objectives.

Analysis from IEA and IRENA suggests European CO2 emissions would need to go to zero by 2050 in order to be consistent with a 66% chance of remaining under 2ºC



Global CO2 emissions would need to go to zero ahead of 2050 in order to keep global warming to 1.5ºC, Climate Analytics find



Conclusions: a new assessment of Europe's decarbonisation pathway to both 2030 and 2050 is needed

Conclusions

Since the last 2050 Roadmap was published, new opportunities for faster and cheaper emissions reductions have been developed, ranging from cheap renewables and energy efficiency to digitalisation and circular economy business models.

Climate action has spread internationally, with increasing competition in the global low carbon economy.

At the same time, evidence on the impacts of climate change has grown even starker, leading to a stronger global temperature goals in the Paris Agreement.

A new assessment of Europe's decarbonisation pathways is now needed, including both 2030 and 2050 milestones.

The new EU climate strategy should be designed to enable Europe to take advantage of new opportunities for emissions reductions, strengthen Europe's competitiveness in the low carbon economy, and help to catalyse higher climate ambition internationally.

About E3G

E3G is an independent climate change think tank operating to accelerate the global transition to a low carbon economy. E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change. E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere.

More information is available at **www.e3g.org**

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