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THE NEXT STEP IN EUROPE'S CLIMATE ACTION: SETTING TARGETS FOR 2030

POLICY BRIEF

Reviving the EU emissions trading system and bringing EU greenhouse gas emissions on a 2°C track

Commissioned by Greenpeace

Foreword by Greenpeace

As 2020 edges closer and governments and investors demand certainty beyond, we are witnessing the first moves towards a new EU climate and energy package with 2030 objectives.

But how much must EU greenhouse gas emissions be reduced in order to be effective, adequate and fair? And how can robust 2030 policies help to restore the credibility and effectiveness of the EU emissions trading system (ETS)?

This analysis commissioned by Greenpeace and conducted by Ecofys, illustrates how through the application of widely accepted effort sharing approaches, the EU's 'fair share' in 2030 global emissions reductions could be around 49% compared to 1990 levels (the 49% figure representing the median of a full range from 39 to 79%). Moreover it reveals that in order to restore the effectiveness of the ETS, and accommodate its current surplus of allowances, an additional reduction of 7 percentage points will be required.

Considering these findings, Greenpeace is calling on EU governments, the European Parliament and the European Commission to:

> Revise the 40% domestic emissions reduction milestone that is currently the Commission's basis for post-2020 EU policy development. Both the surplus of ETS allowances and global effort sharing necessitate its upgrade. Without tackling the surplus of ETS emissions allowances, a 40% economy-wide climate target would bring the EU on an emissions pathway towards 33% reductions by 2030.
> Adopt a domestic EU greenhouse gas emissions reduction target of at least 55% by 2030 (compared to 1990 levels). The Greenpeace Energy [r]evolution scenario outlines an EU pathway for achieving these emissions reductions in the energy sector.
> Prohibit the use of offset credits post-2020.
> Ensure that a 2030 greenhouse gas reduction target is part of a consistent and integrated package of measures, with a binding target for renewable energy of 45% and a target for energy savings. Moreover, the EU must provide by 2030 a 'fair share' of new and additional finance supporting climate action in developing countries.

The faster we reach a peak in global greenhouse gas emissions, and subsequently reduce them as close to zero as possible, the greater our chances of preventing irreversible and catastrophic climate consequences for mankind. Greenpeace therefore believes that a reduction of at least 80% in global greenhouse gas emissions by 2050 is both required and possible. The EU can and must reach at least 95% domestic greenhouse gas reductions by 2050 (the upper end of the EU's agreed 80 to 95% greenhouse gas emissions reduction objective). Whether or not the EU can reach its 2050 goal will largely be defined by the 2030 targets due to the long life-times of energy and infrastructure investments. It's crucial we get this right.

By Niklas Höhne, Alyssa Gilbert, Markus Hagemann,
Hanna Fekete, Long Lam, Rolf de Vos; May 2013

The views expressed in this report are those of Ecofys and the authors, not necessarily those of Greenpeace.

Getting back on the 2°C track

This paper explains how setting 2030 targets will reinvigorate the ETS and will put EU emissions on track to limit global temperature increase below two degrees Celsius (2°C).

- Since 1996 the EU has repeatedly emphasised its commitment to help limit global temperature increase to below 2°C. In order to keep this goal within reach, increasing global emissions need to reach their peak this decade and start declining at a significant pace. But at present, emissions are projected to increase beyond those levels.

This paper describes four key findings for EU policymakers engaged in preparing EU energy and climate measures for 2030 and for the longer term:

- The European Commission estimates that by 2020, the companies participating in the ETS will have accumulated a surplus of 1.5 to 2.3 billion allowances[1], which may be banked and used beyond 2020. This is about the same size as the annual emissions budget of ETS companies (just below 2 billion tonnes).
- Applying equity principles to the global distribution of efforts in reaching the 2°C goal, a indicative 'fair' EU contribution would be a reduction of EU greenhouse gas emissions by around 49% (median of a full range from 39 to 79%) by 2030 compared to 1990 levels.
- The 2030 targets can be set in a way to also accommodate the surplus expected until 2020. If the entire surplus of allowances from the ETS were to be used after 2020, the 2030 target has to become around 7 percentage points more stringent to compensate for that. Alternatively, the trajectory of the target from 2021 to 2030 could be set to compensate for the surplus. In addition, a more ambitious **trajectory** towards 2030 would cast its shadow on the mitigation in the period 2013–2020. It would strengthen the ETS, in conjunction with any other ETS recalibration options such as shifting the auctioning ('backloading') or cancelling allowances before 2020.

1. At the start of the 2030 debate

Over the last year, the EU's institutions have discussed a strategy to meet the EU's long-term climate goal of 80 to 95% greenhouse gas emissions reductions by 2050. Following the debate on the European Commission's '2050 low-carbon roadmap' and '2050 energy roadmap', twenty-six of twenty-seven EU member states requested the Commission to prepare a new set of climate and energy measures and initiatives for the period after 2020. The Commission published a Green Paper regarding 2030 climate and energy policies[2] and started a consultation process with EU member states and stakeholders. This will help frame the climate and energy policy to give a long-term perspective for investment beyond 2020. Also some industrial stakeholders advocate a 2030 EU Climate and Energy Package, because they recognise business opportunities[3].

Setting 2030 targets will require consideration of the following three major developments in emissions targets towards 2020.

[1] One allowance represents one tonne of CO_2 equivalents (tCO_2e).
[2] European Commission 2013, Green Paper "A 2030 framework for climate and energy policies", COM(2013) 169 final, See: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0169:FIN:EN:PDF
[3] In February 2012, a coalition of European energy companies called for a 2030 climate and energy package in an open letter to the European Commission and the Presidency of the Council of the European Union. See: http://static.euractiv.com/sites/all/euractiv/files/Open%20Letter_FINAL-2.pdf

ETS in need of recalibration

The effectiveness of the ETS – seen as an important instrument for reducing emissions in industry and energy generation, now and in the longer term – has been the subject of intensive debate. A large surplus of emissions allowances has accumulated in the system, due to a significant inflow of international offset credits of an unprecedented scale and to a significantly reduced industrial production because of the economic downturn.

ETS rules allow the large surplus to be banked and used in future years of the ETS. This surplus of emissions allowances is expected to last for at least a decade.

In July 2012 the European Commission published a Working Document[4] containing estimates of the surplus by 2020 in two scenarios:

- **The baseline scenario:** no additional renewable policies are implemented after 2009 and emissions stay flat until 2020. The baseline scenario results in surplus of allowances by 2020 of approximately 1.5 billion EU allowances (EUAs);
- **The reference scenario:** renewables targets are fully implemented and ETS emissions decrease at the same rate as the EU ETS cap (1.74% a year). This results in a surplus of 2.3 billion EUAs.

The EU ETS cap in 2013 amounts to almost 2.0 billion tonnes CO_2e. The ETS surplus by 2020 is of the same magnitude. The surplus has been caused in part by economic crisis and mitigation measures elsewhere. This surplus allows industries to stay on a slower emissions reduction trajectory than would have been the case without the surplus. This implies that further post-2020 emissions reduction by industry will not be simply a matter of extending trends until 2020 also after 2020. Or said in another way: mitigation measures will be delayed, risking a costly lock-in of high-carbon technologies.

Non-ETS sectors are also overachieving their targets

In the sectors that are not included in the ETS, a similar picture can be observed. Calculations performed here on the basis of projections provided by the European Environment Agency[5] (EEA) suggest that 2020 non-ETS emissions will be lower than the targets set, creating a surplus of between 1.1 and 2.2 billion annual emissions allocations (AEAs) by 2020. These AEAs can be banked or sold by member states in the period 2013–2020 to iron out temporary peaks and lows in emissions. However, current rules (EU Effort Sharing Decision) do not allow their use after 2020.

EU's 2020 energy and climate targets are inconsistent

While discussing the 2030 targets, policy makers should be well aware of these surpluses, but also of an internal inconsistency in EU's 2020 targets. Several studies (e.g. Commission analysis on the 2050 low carbon roadmap[6] or a study by Ecofys 2011[7]) combined the EU 20% renewable energy share with the indicative 20% energy efficiency target for 2020. Together

[4] European Commission, 2012. COMMISSION STAFF WORKING DOCUMENT Information provided on the functioning of the EU emissions trading system, the volumes of greenhouse gas emissions allowances auctioned and freely allocated and the impact on the surplus of allowances in the period up to 2020 http://ec.europa.eu/clima/policies/ets/auctioning/third/docs/swd_20120724_en.pdf

[5] EEA, 2012. Greenhouse gas emissions trends and projections in Europe 2012. Tracking progress towards Kyoto and 2020 targets, Copenhagen

[6] European Commission, 2011. Commission staff working document – impact assessment – accompanying document to the communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the regions – a roadmap for moving to a competitive low carbon economy in 2050 {COM(2011) 112 final} {SEC(2011) 289 final}.

[7] Höhne, N., Hagemann, M., Moltmann, S., Escalante, D., 2011. Consistency of policy instruments. How the EU could move to a -30% greenhouse gas reduction target

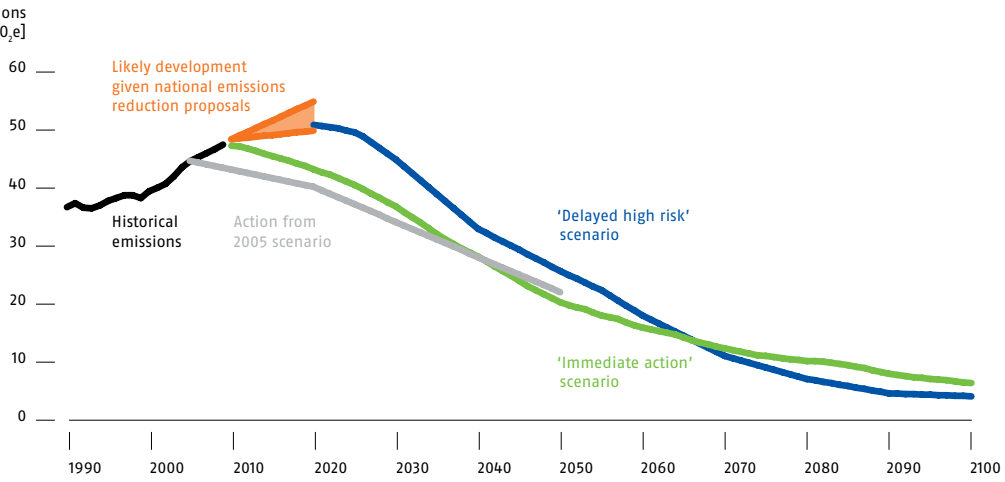


Figure 1

Greenhouse gas emissions pathways towards a temperature increase of 2°C[9]. All 2°C pathways use similar but still different assumptions and are therefore not strictly comparable.

they lead to an emissions reduction of 25 to 30%, which is significantly lower than the overall 2020 greenhouse gas emissions target of 20% below 1990. Assuming additional reductions in non-energy sectors, domestically, a reduction up to 32% was deemed possible.

Recent EEA projections confirm this picture. Taking into account planned domestic policies and measures, they indicate an emissions reduction of 25% below 1990 by 2020[8]. The Energy Efficiency Directive, adopted by the EU in October 2012 foreseeably to be implemented by member states in the coming years, was not included in these calculations.

2. What target for 2030?

In addition to adjusting the EU climate policies and the ETS before 2020 – which would take much political debate – stricter longer-term action could be set, for instance for the period up to 2030. Here we estimate what the ambition level for 2030 could be.

To define the right level of EU climate action for up to 2030 we take into account the following:

> Global emissions scenarios that are consistent with the 2°C goal.
> Global effort sharing formulas, indicating the EU's 'fair share'.
> The trajectory of the emissions in the EU towards 80 to 95% reduction in 2050.
> The surplus in ETS.

Global emissions scenarios

Global greenhouse gas emissions have risen increasingly over the last few decades (black line in Figure 1). In order to limit temperature increase to 2°C at lowest global costs, emissions should be bent to reach their peak in the next few years, followed by a decline at a globally unprecedented rate for several decades ('immediate action' scenario, green line in Figure 1).

In 2008, when the EU 2020 energy and climate package was agreed, global scenarios towards 2°C were used as a basis that already started with reductions in 2005 and resulted in lower global levels by 2020 (grey line in Figure 1). As such, what we call an 'immediate action' scenario here is in fact already a 'delayed high risk' scenario.

The sum of all current emissions reduction pledges that all countries made within the international climate negotiations for the year 2020 (range represented by orange lines in Figure 1) is not sufficient to stay on track with the 'immediate action' scenario[10]. So new high risk scenarios have been developed (represented by the blue line in Figure 1) that still aim at 2°C, but assume that international action until 2020 will be limited to the emissions proposals made to date.

Under such 'delayed high risk' scenarios, the allowed global emissions level in 2020 and 2030 is higher, but it has to be compensated by more stringent and faster reductions afterwards. These scenarios, therefore, include significantly higher risks of not achieving the 2°C limit, because their prerequisites are very demanding:

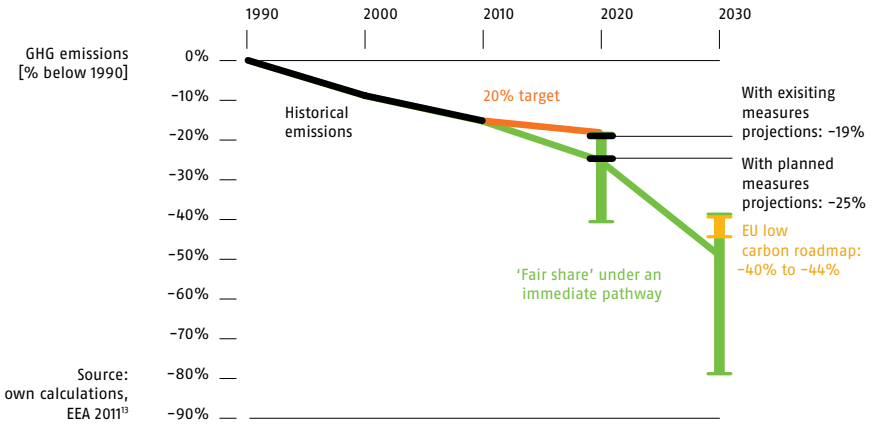
[8] EEA, 2012. Greenhouse gas emissions trends and projections in Europe 2012. Tracking progress towards Kyoto and 2020 targets, Copenhagen

[9] Sources: 'Immediate action' scenario: UNEP 2011: UNEP, 2011a. Bridging the Emissions Gap. A UNEP Synthesis Report. http://www.unep.org/pdf/UNEP_bridging_gap.pdf, Nairobi, Kenya; Climate Action Tracker 2012: Climate Action Tracker, 2012. Climate Action Tracker. http://climateactiontracker.org/. OECD 2011: OECD, 2011. OECD ENVIRONMENTAL OUTLOOK TO 2050. CHAPTER 3: CLIMATE CHANGE. PRE-RELEASE VERSION, NOVEMBER 2011, 'Delayed high risk' scenario: Vliet et al. 2012: Vliet, J., Berg, M., Schaeffer, M., Vuuren, D.P., Elzen, M., Hof, A.F., Mendoza Beltran, A., Meinshausen, M., 2012. Copenhagen Accord Pledges imply higher costs for staying below 2°C warming. Climatic Change (Climatic Change), 113, 551–561

[10] However there is the possibility that countries will increase their pledges

Figure 2

The EU's 'fair share' under an 'immediate action' pathways for different effort sharing principles (the line shows the median, the bars show the full range). For comparison, current EEA projections and reduction targets from the EU Commission's low carbon road map are included.



- **All mitigation options are required.** For instance: Technologies that are not readily available to date are also needed, such as technological solutions that result in net negative emissions. Negative emissions would be required to compensate for a late start of the decline in emissions.
- **All technologies need a high diffusion rate.** But the high diffusion rates and potential in models may be limited in reality, for several reasons.
- **They imply higher costs:** Any cost savings before 2020 are more than offset by increased costs after 2020.
- **Bigger risks for ecosystems.** Higher emissions in the short term and lower emissions in the long-term result in a higher rate of change in temperature in the coming decades, which may be too high for ecosystems to adapt to.

The EU's 'fair share'

The 2°C goal, that was agreed by the EU in 1996 and reconfirmed many times later, is the starting point of an indication of the **EU's 'fair share'** within global pathways.

An indicative 'fair share' can be provided by using equity principles for defining a reasonable share in the total effort by all countries. As the perception of 'fairness' is largely subjective, we apply a range of equity principles reflecting the various positions in the international climate change negotiations. For instance, in one type of equity approach all countries participate immediately, working towards converging per capita emissions. In other approaches some countries are obliged to start reducing earlier than others based on their historical responsibility for climate change and/or economic capability.

Most effort sharing approaches allow for international emissions trading, meaning that credits can be bought from abroad if the effort cannot be met entirely domestically. If international credits are allowed, developed countries like the EU usually are expected to achieve part of their target domestically and part by the purchase of credits. The domestic emissions may therefore be higher than the nominal target.

According to calculations in this study, the EU's 20% target for 2020 is less stringent than its 'fair share'. Assuming that the 2°C goal is reached at lowest global costs and taking into account different equity principles, the 'fair share' of the EU by 2020 in the 'immediate action' scenario (the green line in Figure 1) would be an emissions reduction of around 25% (median of a full range from 18 to 40%), compared to 1990 (Figure 2). This would also be realistic, as EEA[11] projections already suggest reductions up to 25% if all planned policies are executed. (Earlier calculations by Höhne et al. in 2007[12] indicated that a 'fair share' would require more ambitious reductions for the EU of between 30 and 40%. However, these calculations were based on a global pathway that is no longer attainable as actual emissions since then turned out to be too high, grey line in Figure 1).

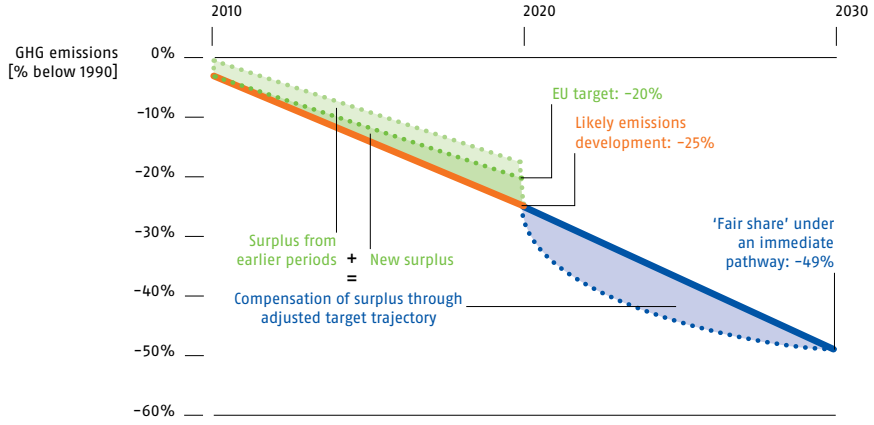
Under the same assumptions, the EU's 'fair share' by 2030 would be an emissions reduction of around 49% (range from 39 to 79%).

The domestic reductions of 40 to 44% by 2030 suggested by the European Commission's low carbon road map are within the lower end of this range of the 'fair share' under global 'immediate action', if they are not watered down by surplus allowances from earlier trading periods. In addition to domestic reductions the EU is assumed to support developing country reductions, e.g. by the purchase of international allowances, which requires the target to be more ambitious than 40 to 44%.

[11] EEA, 2012. Greenhouse gas emissions trends and projections in Europe 2012. Tracking progress towards Kyoto and 2020 targets, Copenhagen
[12] Höhne, N., Phylipsen, D., Moltmann, S., 2007. Factors underpinning future action – 2007 update, Cologne.
[13] EEA, 2012. Greenhouse gas emissions trends and projections in Europe 2012. Tracking progress towards Kyoto and 2020 targets, Copenhagen

Figure 3

Illustrative target trajectory between 2020 and 2030 to compensate for surpluses after 2020 (emissions path as projected until 2020, under a 'fair share' until 2030 and illustrative surplus budgets)



Tackling the surplus

Several options would allow the EU to ensure its 'fair share' towards a 2°C pathway, while tackling the surplus of allowances in the ETS and move towards 80 to 95% emissions reductions by 2050. The options could also be applied in combination[14].

> One option is to increase the stringency of the EU's 2020 climate target to compensate for most of the surplus allowances under the ETS. It would require changing the current cap or the linear reduction factor under the EU ETS and changing targets for the non-ETS emissions of member states.

> A second option would be to cancel some of the auctions, thereby reducing the amount of allowances available in total and effectively reducing the cap in phase II. This will reduce the scale of the surplus, but it would be a challenge to decide the details of timing and quantity. This option is likely to require changes in the ETS legislation.

> A third option would be to change the timing of emissions allowance auctions. The proposal of the European Commission to 'backload' 900 million emissions allowances was rejected by the European Parliament. This option could give an important short term signal to the carbon market. But this option does not provide a structural solution to the surplus of allowances. Backloading only postpones the challenge posed by the surplus.

> A fourth option would be to limit or stop the carry-over of the allowances and/or to limited international allowances with the aim to reduce the amount of allowances available after 2020. If the surplus (estimated at the high end at around 2.3 billion allowances) were to be cancelled at the end of 2020, prices of EU allowances would probably drop, as the market will be 'long' until 2020 because of over-allocation. Actual emissions would still be at 25% below 1990 in 2020, in line with the EU's 'fair share'. This would require changing the ETS Directive.

> Fifthly, stricter post-2020 ambitions could be agreed. A more ambitious pathway for 2021 to 2030 would also affect mitigation from 2013 to 2020, because both private sector actors and policymakers may anticipate the post-2020 obligations.

Setting an adjusted target for the year 2030 or adjusting the trajectory towards 2030 can also compensate or 'eat up' the banked ETS surplus credits. Assuming a linear path from 2021 to 2030, the 2030 target would have to be about 7 percentage points[15] more ambitious than the presently calculated 'fair share' to compensate for the surplus. This would however result in a jump in post-2030 emissions targets, as the EU would readjust to its 'fair' pathway.

A more flexible option is an adjusted **target trajectory** towards 2030. An adjusted pathway would require steeper reduction levels in earlier years (2021, 2022) to compensate for the surplus and level out towards 2030 once the surplus is eliminated. This option would leave the 2020 target as it is and would set the 2030 target on the basis of what is necessary and would use the pathways in between to eliminate the surplus allowances (Figure 3). Technically the target pathway (the dotted blue line) allows that in any given year no actual effort beyond the EU 'fair share' (the blue line) is needed.

[14] The EU Commissions report on the state of the carbon market was published in parallel to our analysis (November 2012). It differs from this analysis in its objective (cancel ETS surplus) and scope (only ETS emissions). Further it does not include any considerations for the period beyond 2020. (European Commission, 2012. The state of the European carbon market in 2012. COM(2012) 652 final.)

[15] Corresponding with a total surplus of 2.15 billion EUAs in 2020

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