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Initiatives' potential and role under the Paris Agreement

For our Environment

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International Climate Initiatives – A way forward to close the emissions gap?

Initiatives' potential and role under the Paris Agreement

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1 Summary

In December 2015 Parties adopted the Paris Agreement at the 21st session of the United Nations Framework Convention on Climate Change (UNFCCC). In its Article 2 governments agreed to limit global warming to "well below 2°C above pre-industrial levels" and to pursue to limit it to 1.5°C (UNFCCC 2015). The UNEP Emissions Gap Report 2015 showed that a gap of 14 $GtCO_2e$ exists for 2030 between the (unconditional) mitigation proposals submitted by Parties as part of their intended nationally determined contributions (INDCs) and a pathway compatible with holding temperature increase below 2°C (UNEP 2015b). Against this background international climate initiatives can play an important role for reducing global emissions. Based on an analysis of 174 initiatives we analysed the potential impact of these initiatives on GHG emissions, shared elements of initiatives which have a high impact and the relationship between such initiatives and the UNFCCC.

This study is a first attempt to quantify the potential impact of such initiatives in comparison to the INDCs. For Brazil, China, the EU, India, Indonesia, Japan, Russia, USA and the Rest of World we compare the ambition level of 19 initiatives with those of the INDCs. The study involved the following key steps:

1) In a first step, we screened 174 initiatives examining their topic area, scope, expected impact, participants and setup. Based on this screening we defined a set of nine criteria to identify those initiatives suitable for further quantitative and qualitative analysis.

2) As a second step we did a quantitative analysis. We first assessed the mitigation impact of the selected initiatives in a Paris Agreement World, i.e. assuming that the world at large will follow an emission pathway based on the implementation of all INDCs. Secondly, we broke the impact down on a national level taking into account national INDCs and the overlap between different initiatives addressing the same sector. Thirdly, we added all remaining impact of the initiatives to estimate how much they can help reduce emissions beyond current pledges.

3) In a third step, we then identified good practice elements shared by initiatives with high impact through a correlation analysis.

4) Finally, we discuss the relationship between these initiatives and the UNFCCC.

For all the steps of our analysis, we assumed that all initiatives will achieve their goals. Additionally, we assumed that all countries will achieve their INDC and not reduce their own efforts due to any additional mitigation coming from such initiatives.

The main results of our analysis are:

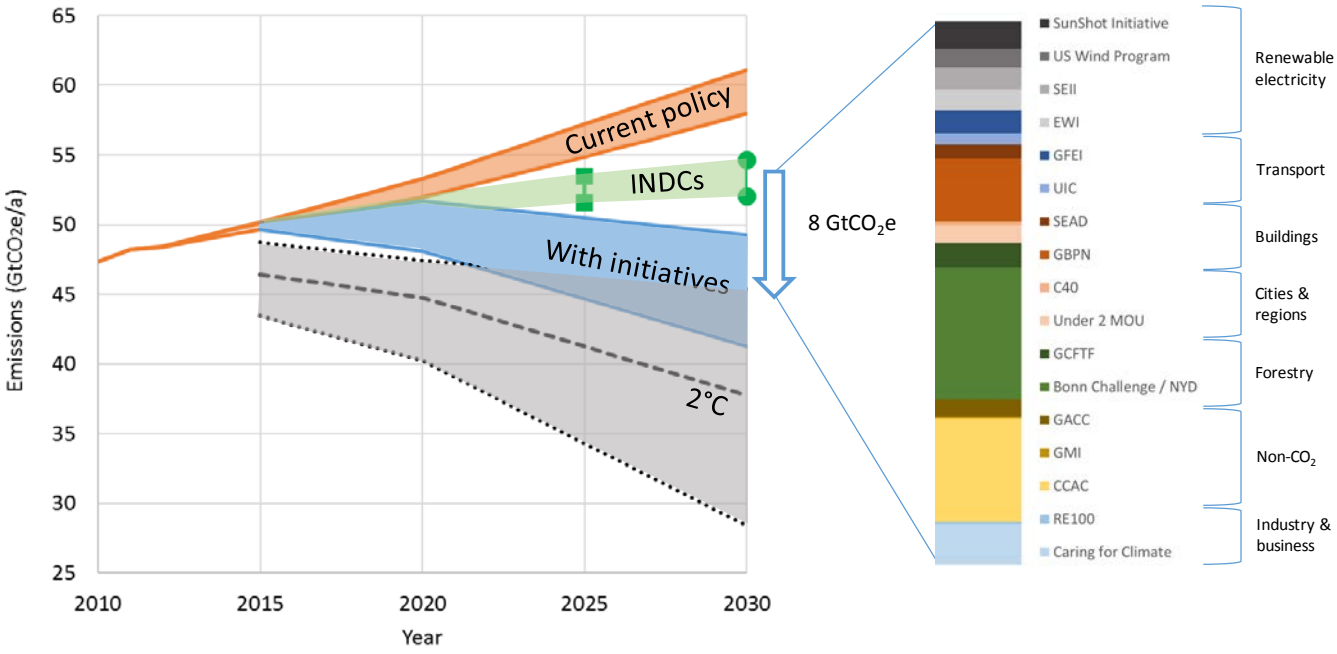
- Initiatives can play an important role in the transition to a low carbon economy. We estimate that the 19 quantified initiatives have the potential to reduce yearly emissions by approximately 5-11 $GtCO_2e$/year (average 8 $GtCO_2e$/year) compared to an INDC background in 2030. Corresponding global emissions would peak by 2020 and bring the world much closer to a 2°C compatible pathway (Figure 1-1).

- Climate initiatives contribute towards achieving INDCs by helping governments in achieving their targets. National governments could be more ambitious with their national contributions to the Paris Agreement, if they would take into account the various actions by cities, regions, businesses and sectors that have been pledged and go beyond their INDCs.

- Non-state action and national action reinforce each other. Both pull in the same direction. The comparison of stringency shows that many initiatives have targets that go beyond those of national governments. If the national governments would take all of the actions into account, they could be more ambitious in their national contributions.

- Active involvement of NGOs either as the leader of an initiative or members tends to lead to higher reductions and more co-benefits. Another common element of many successful initiatives is a permanent secretariat. Voluntary agreements are most suitable for short-term reductions but have a less important role for 2030 targets.
- Most international initiatives from our selection are not quantifiable. For some this is due to their inherent nature (e.g. focus on information exchange or MRV) but for many there is a lack of a clearly defined target, information on actions planned/taken and their impact or follow-up on initial announcements. Adequate reporting from initiatives would greatly enhance transparency, help replicate impacts, inform national governments and the UNFCCC process and facilitate access to funding for the initiatives themselves. A standardised reporting format could greatly enhance transparency.
- Large uncertainties remain and further work is needed. Firstly, we did not analyse whether the initiatives are likely to achieve their targets. Such an assessment would most likely lead to reduced impacts by 2030. On the other hand, we were only able to quantify about one tenth of all the screened initiatives. Adequate reporting would increase the overall impact of climate initiatives.

Figure 1-1 Global emission (incl. LULUCF) and emissions reduction from initiatives



Note: Global emission levels incl. LULUCF (historic, future under current policies, and future under INDC levels) along with the potential overachievement of INDC levels by the analysed initiatives scaled up to the global level. The dashed (dotted) lines indicate the median (10th/90th percentile values) of global 2°C compatible pathways (CAT, 2015). Right: Disaggregation of the contribution of initiatives overachieving INDCs by initiative in 2030 (average number shown). The two CCAC sub-initiatives we analysed (on HFC and CH4 reduction, respectively) have been grouped together under "CCAC". Initiatives with less than 10 MtCO2 expected contribution (ABAOCP and ULCOS) are not in the legend as they are not visible in the graph.

Source: Author's own calculations (initiatives), Climate Action Tracker (2015) (current policies, INDCs)

2 Background

In December 2015 Parties adopted the Paris Agreement at the 21st session of the UNFCCC. In its Article 2 governments agreed to limit global warming to "well below 2°C above pre-industrial levels" and to pursue to limit it to 1.5°C (UNFCCC 2015). According to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), global greenhouse gas (GHG) emissions need to decrease by at least 40% to 70% below current levels by 2050, in order to hold temperature increase below 2°C. During the preparation of the Paris Agreement the Work Stream II of the Ad-hoc Working Group on the Durban Platform for Enhanced Action (ADP) focused on enhancing mitigation actions up to 2020, with the objective to increase efforts in the near future already. This is necessary as the existing mitigation proposals for the year 2020 are insufficient to hold the temperature increase below 2°C compared to pre-industrial levels. The UNEP Emissions Gap Report 2015 showed that a gap of 14 $GtCO_2e$ exists for 2030 between the mitigation proposals submitted by Parties as part of their INDCs and a pathway compatible with holding temperature increase below 2°C (UNEP 2015b). The report also stresses the importance of pre-2020 action for achieving the overall mitigation target.

Besides discussions about increasing the ambition of national mitigation targets of individual countries under the UNFCCC, Work Stream II also discussed which role other international initiatives, which are not part of the UNFCCC, could play in the climate negotiations. It is currently unclear how the process will integrate and account for these activities. The negotiations so far have provided a platform for sharing information on climate initiatives outside the UNFCCC; however, they have not yet led to an increase in ambition in specific sectors. Further, large uncertainty about the potential mitigation impact of these initiatives exists. It is for example unclear, how the ambition level of national actions and targets overlaps with that of international initiatives.

Within the literature, attempts have been made to estimate the impact of international initiatives. For example, PBL estimates reductions of 2.5 $GtCO_2e$ in 2020 and 5.5 $GtCO_2e$ in 2030 resulting from the most relevant initiatives, of which 1.8 $GtCO_2e$ in 2020 and 3.8 $GtCO_2e$ in 2030 overlap with the impact of national pledges and policies (Roelfsema et al. 2015). The overlap goes back to the assumption that emission reductions are only additional, if the country whose emissions are affected does not have a pledge or does not include the targeted sector in their pledge. Further, the report estimates an overlap between the initiatives of 0.2 $GtCO_2e$ in 2020 and 0.3 $GtCO_2e$ in 2030. UNEP estimates that 15 major initiatives could reduce emissions by 2.5 $GtCO_2e$ to 3.3 $GtCO_2e$ in 2020 (UNEP 2015a). The authors of the report assume an overlap of these initiatives with national pledges of one third or less. This is based on a comparison of the existing pledges and the overall mitigation potential.[1]

This study aims at further contributing to increasing the clarity on the role of international initiatives by quantifying their potential for emission reductions and comparing this to the emission levels currently assumed under INDCs.[2] After the selection of a number of initiatives to analyse (see section 3) the following research questions were set:

- What is the potential impact of the initiatives on GHG emissions? To answer this question, first a quantitative analysis of the technical potential of the initiatives is required. Additionally, one needs to check how the initiatives relate to other already ongoing actions, such as national climate policy making, NDCs and other initiatives (see section 4).
- What classifies a good initiative? To answer this question, the report will evaluate which elements make an initiative successful and improve its capacity to effectively reduce emissions (see section 5).

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1 Both the UNEP and PBL studies include potential LULUCF emission reductions from initiatives in the forestry sector in their assessment.

2 In this report we refer only to INDCs, however the term also includes NDCs from countries that have already ratified the Paris Agreement.

- How do initiatives relate to the climate negotiations under the UNFCCC? This part of the project analyses options to integrate initiatives in the UNFCCC process and provides recommendations for the negotiations (see section 6).

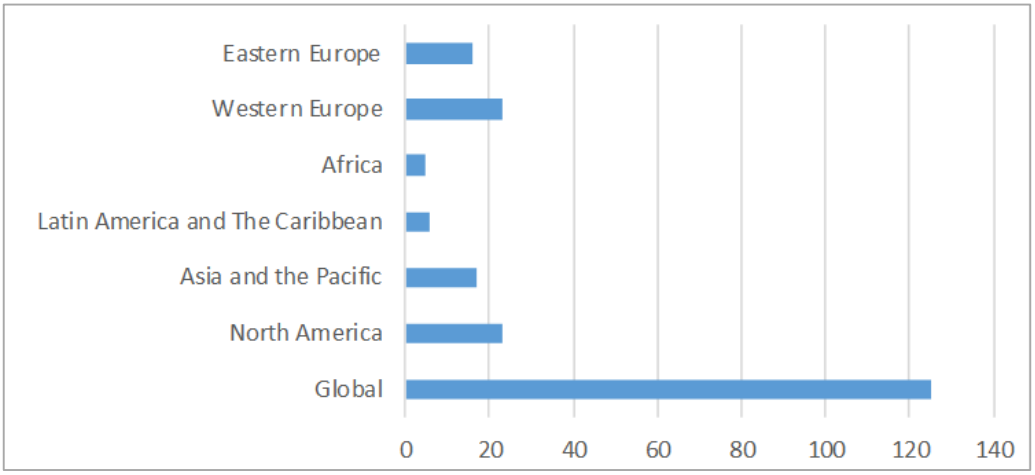
3 Identification of initiatives

In order to ensure that the study collected information on initiatives that were representative of the global potential impact, it was necessary to follow a process to ascertain which initiatives would be considered in the subsequent analysis. In a first step 174 initiatives were screened and classified. The following sub-sections provide an overview of the coverage and scope of these initiatives and those ultimately selected for further quantitative and qualitative analysis.

3.1 Geographical coverage and focus areas of initiatives

Figure 3-1 illustrates the distribution of initiatives to regions. It shows that by far the largest share of initiatives has global coverage. Of those initiatives that are limited to specific regions, most cover North America, followed by Europe and Asia and the Pacific. There are a few initiatives with a focus on Africa or Latin America and the Caribbean. These numbers provide support to the general perception that initiatives are an instrument that mainly involves actors of the global North (compare Chan and Hale 2015).

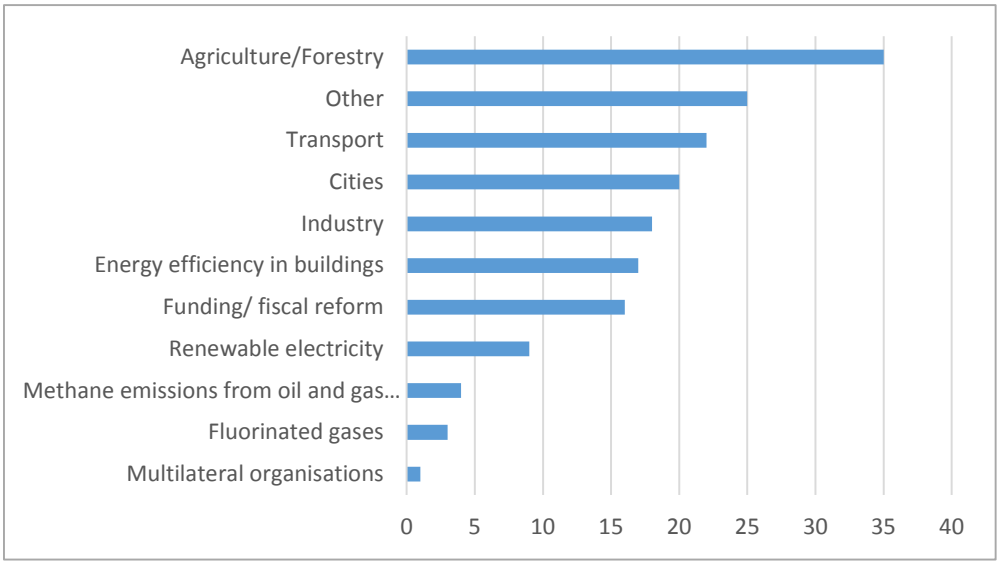
Figure 3-1 Number of initiatives covering geographic regions



Note: Global initiatives are not counted for individual regions. One initiative may cover various regions.
Source: Author's own illustration

Figure 3-2 gives an overview of the distribution to focus areas. Themes that are well covered by initiatives are renewable energy and energy efficiency, as well as cities and subnational governments and businesses. In terms of sectors, agriculture and forestry as well as transport are a focus of initiatives. Other sectors (energy supply, industry, buildings) are all of similar importance. Areas that are less covered are the multilateral organisations, fluorinated gases and methane emissions from oil and gas production. Reasons for this could be that those issues are well covered in other mechanisms (e.g. F-gases under the Clean Development Mechanism and short term pollutants are already regulated by national legislation in many countries).

Figure 3-2 Number of initiatives covering focus areas



Source: Author's own illustration

3.2 Characteristics of initiatives and topic areas

3.2.1 Formulation of commitments

Of the 174 initiatives, about 25% have a clear commitment. In some cases, this commitment is of qualitative nature, or there is no overarching commitment for the total initiative, but the commitments are fixed on a member level. Most initiatives with clear commitments are in the transport sector, followed by cities, agriculture and forestry and industry. Further, renewable electricity and energy efficiency in buildings have a relatively high number of initiatives with a commitment.

These numbers approximately reflect the distribution of topic areas, nevertheless, some topic areas with a large number of initiatives overall tend to have less clearly formulated commitments. The largest deviation is evident in the sector "agriculture and forestry", where there are more than 35 initiatives in total, but only 7 (19%) have a clear quantified commitment. This ratio is much more promising for initiatives for energy efficiency in buildings (38%) and renewable electricity (44%). However, the total number of initiatives in these sectors is lower.

3.2.2 Reporting and monitoring

The availability of information on monitoring and reporting frameworks of the initiatives is unfortunately limited. From the description of the initiatives on their websites it is often not clear, whether they regularly monitor and report their activities or progress towards their targets. Thus, our data shows significant gaps here and the conclusions are limited.

Of the 180 initiatives included in this overview, 54 have implemented a framework for regular reporting. This may for example be annual reports of activities and progress of the overall initiative, or reporting of greenhouse gases emissions and/or reductions, other performance indicators or actions of individual members.

For 93 initiatives, no information could be found within the scope of this project phase. The remaining either have in place conditions which would allow them to regularly report, although they do not yet do so, or do not have any monitoring and reporting system.

3.2.3 Distribution of responsibilities

Of all the initiatives considered here, only 22% have established a permanent secretariat. This is of relevance as it provides the organisations with a stable structure and helps to assure continuance of the activities. Particularly in the transport sector, a high share of initiatives has a permanent secretariat (41%). This share is also high in the topic area "Methane emissions from oil and gas production", however only four initiatives in this area are included in our analysis.

3.3 Choice of initiatives and topic areas for further analysis

In order to select a number of initiatives for the quantitative and qualitative analysis, the following key criteria were considered:

- *Concrete definition of aims and activities*: This does not exclude activities without a quantified target but requires that the goals of the initiative and strategies to reach this goal are clearly defined.
- *Data availability:* The initiative needs to transparently show information to allow for a quantitative or qualitative assessment of its impact on emission reductions.

These two key criteria mainly determined the number of initiatives selected for further analysis, however the following additional criteria were also considered during the selection process and in the qualitative analysis when identifying best practice:

- *High mitigation impact in the envisaged topic area:* A high mitigation potential in the tackled area should have been identified by another source (e.g. UNEP gap report) to ensure that the initiative is able to make a meaningful contribution to the global efforts.
- *Direct mitigation impact expected:* It needs to be clearly stated how the initiative aims to contribute to mitigation so that a quantified impact can be expected or any other approach to contribute to mitigation is defined.
- *Significant geographical scope:* The initiative needs to have a scope that is sufficiently large to contribute to mitigation in a meaningful way.
- *Innovativeness of approach:* The initiative needs to be able to trigger support for its cause as well as public attention.
- *Relevance of the issue:* The initiative needs to tackle an issue that is of interest for a sufficiently large group of stakeholders. Co-benefits such as improving air quality, reducing poverty or adaptation to climate change can dramatically increase the relevance for stakeholders and the likelihood for implementation.
- *Influence of the initiative:* The initiative shall involve well-known and influential members in order to be able to reach its envisaged targets and raise public attention.
- *Timeframe:* The initiative should aim to achieve relevant results by 2020/2030.
- *Outside of national action*: the initiative should contribute to emission reductions that are not primary driven by national governments and are outside of the national action that is usually reported under the UNFCCC process.

When applying these additional criteria to the overall list of initiatives, not all of them need to be fulfilled in order to select an initiative for further analysis. Rather, they serve as guidelines for filtering the database in order to get to a selection of initiatives that are representative of the overall landscape of initiatives in terms of topic areas, actors and global distribution.

4 Quantitative assessment

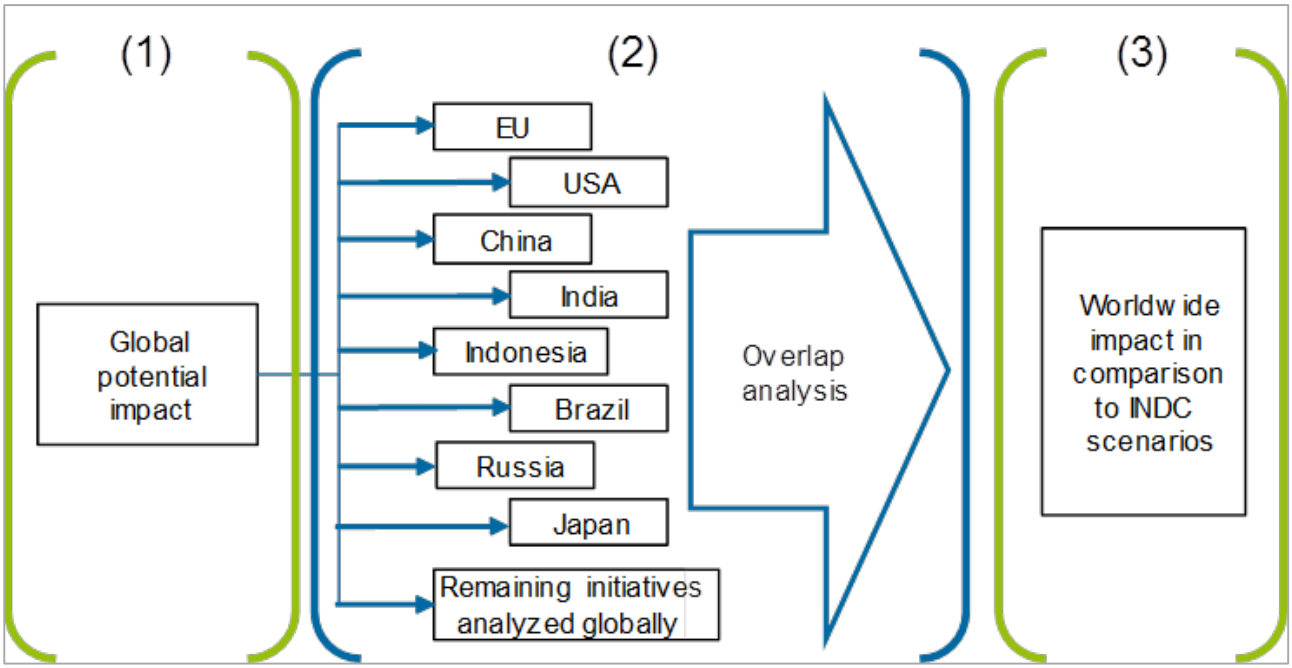
The quantitative analysis of initiatives has been performed in three distinct steps (Figure 4-1).

- In principle, all initiatives can contribute towards countries reaching their INDC ambitions, but some may also have an impact that is likely to go beyond quantified INDC targets. In the first step, the global potential impact of the selected initiatives has been estimated against global scenarios of current policies including INDCs, or (if such a scenario was not directly available) our own approximation of what a realistic baseline scenario under INDCs would look like.[3] The estimations are based on converting the quantified/quantifiable goal of an initiative into an energy- or emissions-related metric that can be compared to the outcome of the INDC scenarios. This first step serves to assess the overall emission reductions that an initiative theoretically covers, and thus get an idea of the "scale" of the initiative. This step does not include any assessment of possible overlaps between initiatives within and across sectors or with potential double-counting between initiatives.
- In the second step, the impact of the initiatives – wherever possible – was broken down to the level of eight countries: Brazil, China, the EU, India, Indonesia, Japan, Russia and the USA. The impact in each of these countries was assessed by taking into account the overlaps of the initiatives with other initiatives in the same sector, initiatives in other sectors, and any particular specific policy or INDC elements in the country not considered in the global INDC scenarios in the first step. Types of overlaps considered include:
  - One commitment counted twice, i.e. when the same company/city/etc. is subscribed to two different initiatives with a similar target;
  - Initiatives quantification of whose target is expressed in the same metric and which therefore could be complementary or overlapping;
  - Initiatives that replace the same emissions, i.e. the targets of solar and wind energy initiatives both striving for a certain share of electricity generation could together account for a higher share of generation than there are non-renewables to replace;
  - Initiatives with targets formulated at an aggregate level, i.e. city/region initiatives, or business initiatives, striving to reduce total emissions below a certain baseline, which could be partly achieved by (for instance) renewable energy, buildings, transport, and waste sector initiatives.

  The aggregate of initiatives on a country-by-country basis thus represents in how far the impact of the initiatives goes beyond the country's own INDC. If an initiative could not be analysed on a country-by-country basis, the overlap analysis was done on the global level.
- In the third step, the country specific impacts of initiatives – now with overlaps among initiatives taken into account – were aggregated back to a worldwide level, thus resulting in an overall potential impact including overlaps that could be compared to projections resulting from INDCs on the global level.

[3] For the energy sector we used as baseline the "New Policies Scenario" of the IEA World Energy Outlook 2015, which takes into account the energy-related components of all INDCs submitted by 1st of October 2015.

Figure 4-1 Schematic representation of the three steps outlined above



Note: (1) The calculation of the potential impact of each initiative in absolute terms; (2) the disaggregation of these impacts to a country-level and the analysis of their contribution relative to countries' INDCs and the overlaps between initiatives; (3) the re-aggregation of these results to the global level, resulting in the impact of initiatives relative to worldwide INDC trajectories.

Source: Author's own illustration

4.1 Global potential impact

The assessment of the overall potential impact going beyond INDCs of the selected initiatives has led to the estimated reduction levels plotted in Figure 4-2 By 2030, a high global impact beyond INDCs could be attained by the Climate and Clean Air Coalition's (CCAC) sub-sectoral initiatives striving to reduce black carbon[4], methane and HFC[5] emissions. This is due to its high level of ambition in reducing non-CO_2 climate pollutants in combination with the comparatively low number of quantified goals in INDCs addressing methane and HFC emissions reductions. The Bonn Challenge / New York Declaration on Forests could have a similarly high impact due to its high ambition in afforestation (although our estimation is subject to a comparatively high uncertainty, owing to the nature of estimating emissions from forestry), another area where there is a general lack of quantified targets in INDCs (Climate and Clean Air Coalition 2016; Petersen, K. & Varela, J. 2015).

[4] As black carbon is not included in most projections of GHG emissions, the figures below do not include reductions of black carbon emissions.

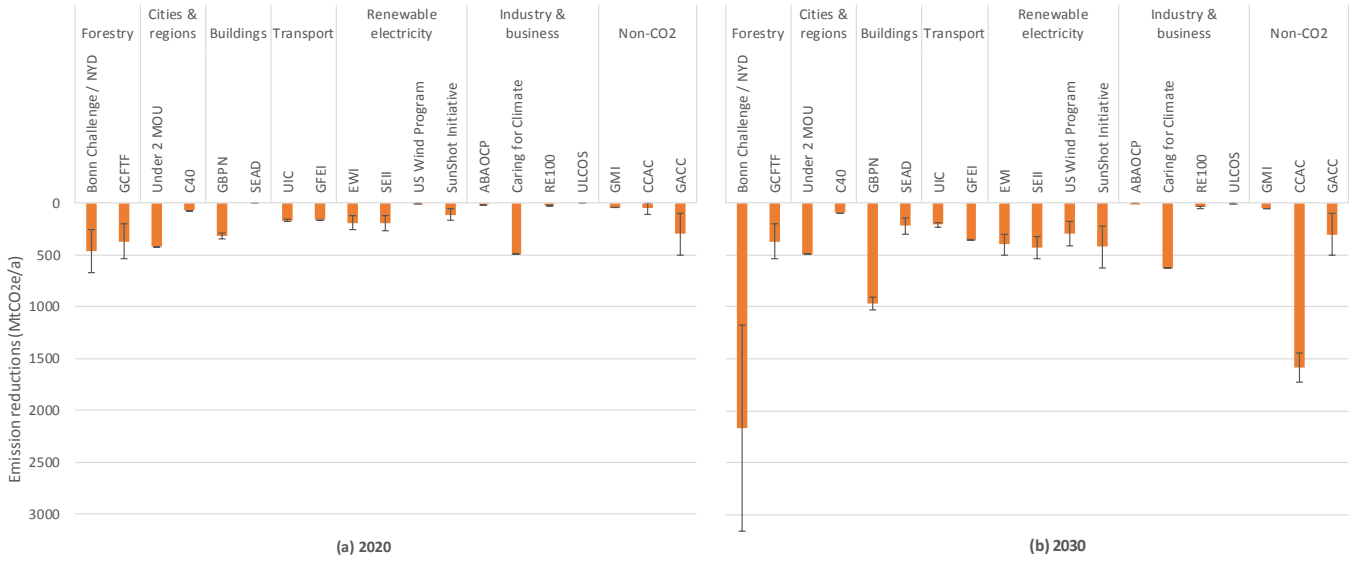
[5] Note that the CCAC aims to reduce HFCs via an amendment of the Montreal Protocol. As it is ambiguous whether to treat such reductions as a contribution of the CCAC, the uncertainty range in Figure 4-2 reflects the potential impact of the targeted HFC emission reductions in active CCAC members (US, Canada, EU).

Most initiatives in the power, buildings and transport sector have been estimated to have the potential to reduce emissions by numbers in the order of hundreds of $MtCO_2e$/year by 2020 and 2030. These initiatives focus on diverse issues such as renewable energy generation, energy efficiency appliances, reduction of thermal energy demand and increased fuel efficiency. Some of these initiatives apply only in certain regions whereas others are estimated to have potential impact across all investigated countries/regions.

The potential impacts of the industry initiatives are quite diverse in size. It must be mentioned here that business initiatives have been assessed based on the current pledges of their signatories, and they are generally expected to grow by getting higher numbers of endorsers and signatories over the next years, which could lead to potentially much higher reductions than found here. For the Ultra-Low CO_2 Steelmaking (ULCOS) - the most ambitious initiative to reduce emissions in steelmaking - the reason for the comparatively low reductions until 2020 and 2030 is that most of the technologies under development are only expected to be ready for roll-out by the end of the 2020s.

The initiatives categorized under "companies", as well as the Global Alliance for Clean Cookstoves, have not been disaggregated to the country-level. For the company initiatives, emissions of each company would have to be broken down to countries (information, which is often undisclosed) which is beyond the scope of this analysis. The Global Alliance for Clean Cookstoves, on the other hand, would have an impact on the global level but very little in most of the countries/regions (USA, EU, etc.) investigated here, and has thus only been quantified globally (as has its overlap with other initiatives).

Figure 4-2 Global potential impact of the quantified initiatives in 2020 and 2030



Note: The estimated overall (global) potential impact of the initiatives selected for quantification until 2020 (a) and 2030 (b). These numbers have been calculated against a baseline scenario on a global level that assumes full implementation of the INDCs. Error bars indicate uncertainties in the translation of the initiative's quantified goals to emission reductions.

Source: Author's own illustration

Full details on the estimations of the global potential impacts are available in an accompanying report, providing all necessary information to replicate the analysis. The general methodology was to translate an initiative's targets/goals into an energy- or emissions-related metric depending on the nature of the initiative. For example, we expressed the target of RE initiatives in additional renewable energy generation in MWh by 2020/2030, or potential for reducing emissions from deforestation in Mt CO_2 by 2020/2030 for a forestry initiative. These values were then compared to baseline INDC trajectories of the same metric up to 2020/2030.

The differences between the total 2020 and 2030 potential impact stems mainly from two factors. Firstly, initiatives' ambition generally is estimated to be higher for 2030 than for 2020 (some initiatives set intermediate targets for 2020 and 2030; for others, we have estimated the intermediate potentials based on the overall ambition of the initiative). Secondly, the baseline values for overall emissions for 2020 are lower than those in 2030, as global emissions are projected to keep rising under INDC implementation in the time horizon 2020-2030.

4.2 Country-level assessment

In this section, we describe the main results from the country-level analyses of the EU as an example. The EU has been treated as a "country" in this context because the European Commission submitted one INDC to the UNFCCC on behalf of all its member states. Similar analysis will be available for Brazil, China, India, Indonesia, Japan, Russia and the USA in an upcoming report. Unless mentioned otherwise, emission trajectories (historic, current policies and INDC levels) shown in this chapter are from the Climate Action Tracker (2015) which in turn takes its data from various authoritative sources.

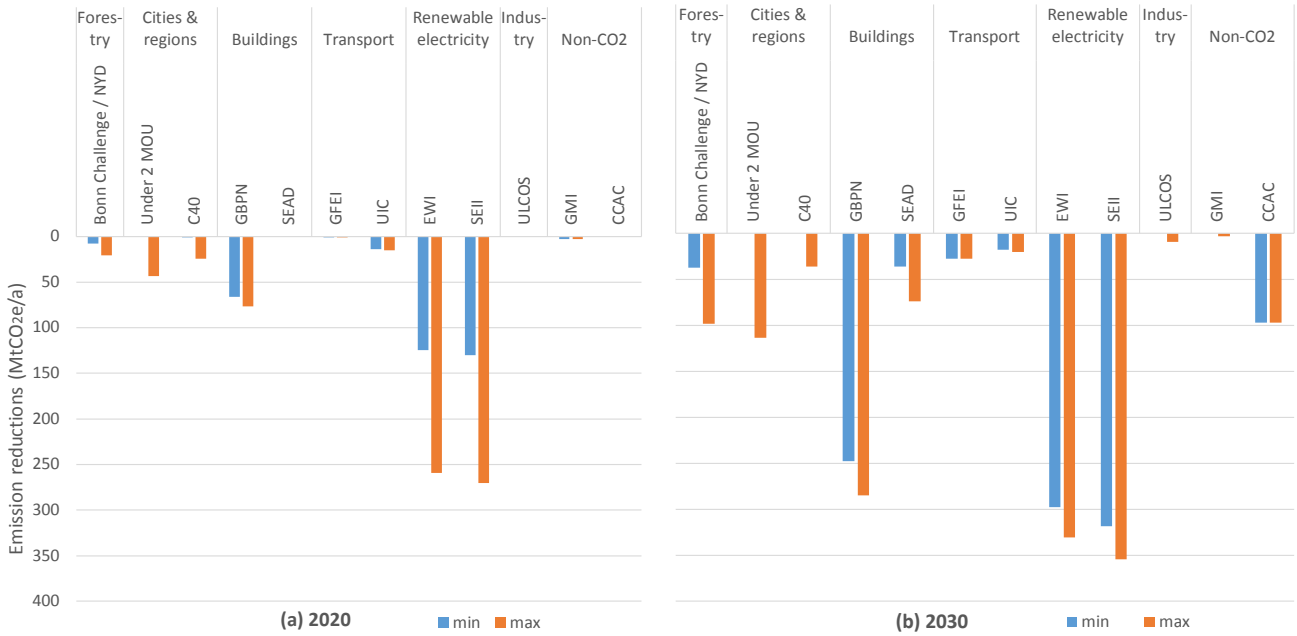
4.2.1 Country-level assessment example: EU

The largest contributors to potential emission reductions beyond INDC levels in the EU are given by the European Wind Initiative and the Solar Europe Industry Initiative. Both are EU-only initiatives; the former aims for a share of wind energy of 20% (33%) by 2020 (2030) of the EU's total electricity generation, compared to 12% (19%) under the IEA's New Policies Scenario (NPS); the latter aims for a share of solar energy of up to 12% (20%) in electricity generation by 2020 (2030), compared to 4% (12%) under the NPS. This translates to a large potential for further decarbonisation of the power sector, with impacts of in the order of hundreds of megatons of CO_2 per year (Figure 4-3). Similar impacts could be attained by energy efficiency measures in the buildings sector.

Other initiatives that contribute are those of the many C40 cities and Under2MOU signatories in the EU, many of which have set emission reduction targets below a base year that turn out more ambitious than the EU's overall target of achieving at least 40% by 2030 below 1990 levels, under the assumption that the implementation of all such targets would follow a linear trajectory between base year and target year. The potential impact by 2030 is furthermore increased by the ambition of SEAD (thermal energy in buildings), UIC (modal shift to public transport), ULCOS (enhanced steelmaking technologies) and CCAC (reduction of short-lived climate pollutants). Notably, the full impact of CCAC in the EU is achieved by the reduction of CH_4 emissions, as targets for HFC reduction do not go beyond current EU regulation on fluorinated gases.

Overlaps between initiatives are illustrated by two cases: the lower values indicate highest possible overlaps between initiatives, and the higher values indicate complete additionality of all initiatives (Figure 4-3). This figure includes only those initiatives whose potential was estimated to go beyond the INDC baseline. For instance, we estimate the impact of the CCAC sub-initiatives on CH_4 and HFC emission reductions by 2020 to be less than the reductions under the baseline by 2020 (which is why no CCAC impact is shown in the left-hand chart), but more than the reductions under the baseline by 2030.

Figure 4-3 Potential impact of initiatives in the EU in 2020 and 2030



Note: Potential impact (compared to INDC levels) of initiatives in the EU up to 2020 (a) and 2030 (b), with minimum numbers assuming largest possible overlap with other initiatives, maximum values indicating complete additionality of all initiatives. If a "minimum" bar is zero whereas the "maximum" bar is not, this indicates that the initiative has a potential impact on emission reduction beyond INDC levels, but could be overlapped completely by (an)other initiative(s).

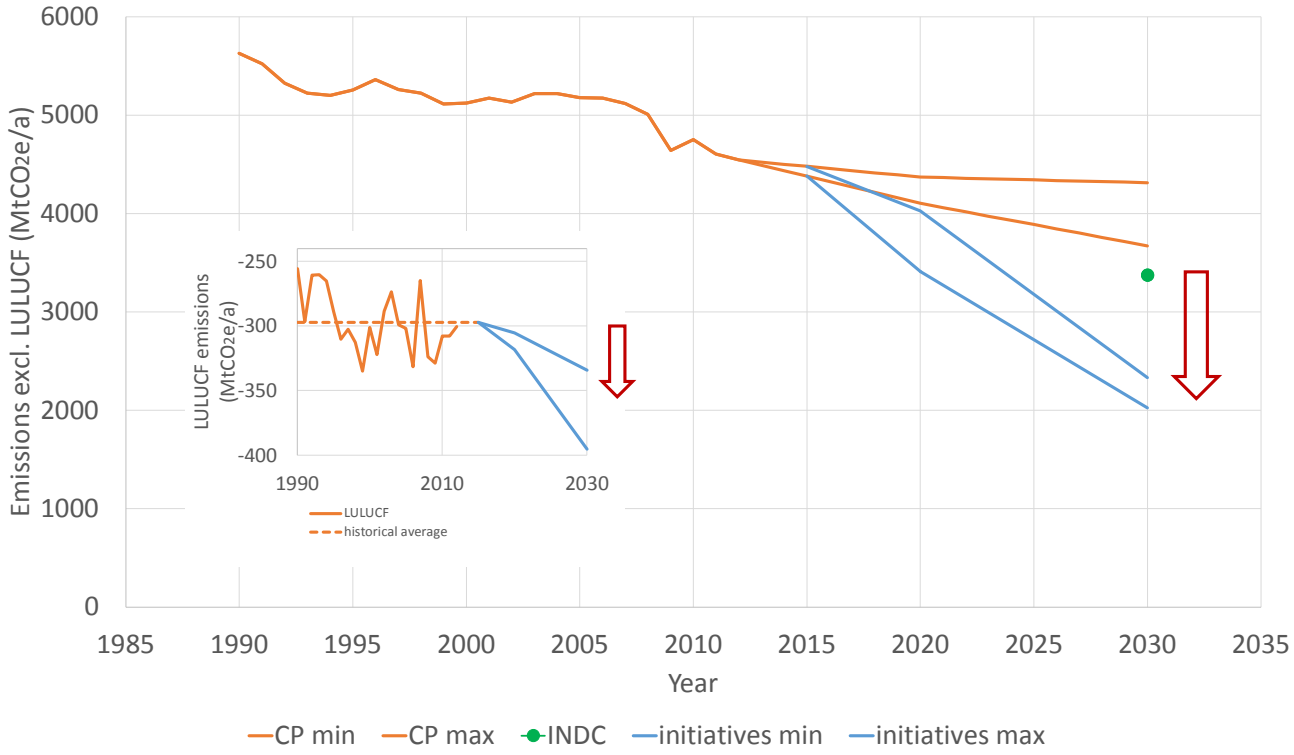
Source: Author's own illustration

The emission reduction from the initiatives are aggregated into overall economy-wide emission reductions and compared to historical and future projection trends of emissions in the EU from all sectors (Figure 4-4). EU's emissions (excluding forestry) could roughly be cut in half by 2030 compared to current levels if the initiatives deliver according to their ambition. Similarly, the inset to Figure 4-4 shows reduction potential in the LULUCF sector.

Graphs with potential reductions excl. LULUCF for all countries are included in Figure 4-5 (please note the non-uniform vertical scale between the different graphs). For Indonesia, we have included the LULUCF graph in an inset, as it is the only country where this represents the major share of potential initiative reductions. Full details on the assessments in the other seven countries analysed will be available in a future report, as will full descriptions on the calculations involved.

Importantly, large-scale initiatives in the power sector only appear in the EU and the US in our analysis, where their potential impact is significant. We note here that this reflects a lack of comparable initiatives in the other countries, not necessarily an unambitious INDC in the EU and US, nor that other countries have more ambitious INDCs. It is merely a manifestation of the fact that we are not aware of similar initiatives in other countries that fall outside of what is covered in INDCs, and of the fact that these power sector initiatives themselves have set very ambitious targets for the EU and US.

Figure 4-4 Emission levels for the EU under Current Policies, INDC and initiatives' potential



Note: Emission levels excl. LULUCF in the EU historically, under current policies (CP, excluding INDCs), INDC levels, and under the initiatives' reduction potential (initiatives min/max). Inset: LULUCF emission removals, historical data (plus historical average, taken as baseline) and potential reductions from initiatives.

Source: Author's own calculations (initiatives), Climate Action Tracker (2015) (current policies, INDCs)

4.2.2 Initiatives analysed globally

The initiatives not scaled down to a country level include three business initiatives (Caring for Climate, the American Business Acts on Climate Pledge (ABAOCP), and RE100) and the Global Alliance for Clean Cookstoves (GACC). The former have not been scaled down due to a lack of data to know which emissions reduction should be counted in which country. The latter has not been taken along due to the fact that its impacts are assumed to be highest in countries outside of the analysed sample of eight.

Furthermore, due to the fact that non-CO_2 gases account for a large share of the emission reductions of improved cookstoves (Lee et al. 2013), the overlap between reductions from CCAC and the Global Alliance for Clean Cookstoves is best calculated on the worldwide level.

4.3 Aggregation to global level

In the last step of this analysis, we have aggregated the country-level impacts with all overlaps taken into account back to a worldwide level, thus resulting in an overall potential impact including overlaps that could be compared to current policy (including INDC) projections on the global level.

In order to re-aggregate an initiative back to a global level, we had to make an estimation of the contribution of the initiative to the "rest of the world" (i.e. outside of the eight countries analysed in detail). Thus, the global numbers calculated here are:

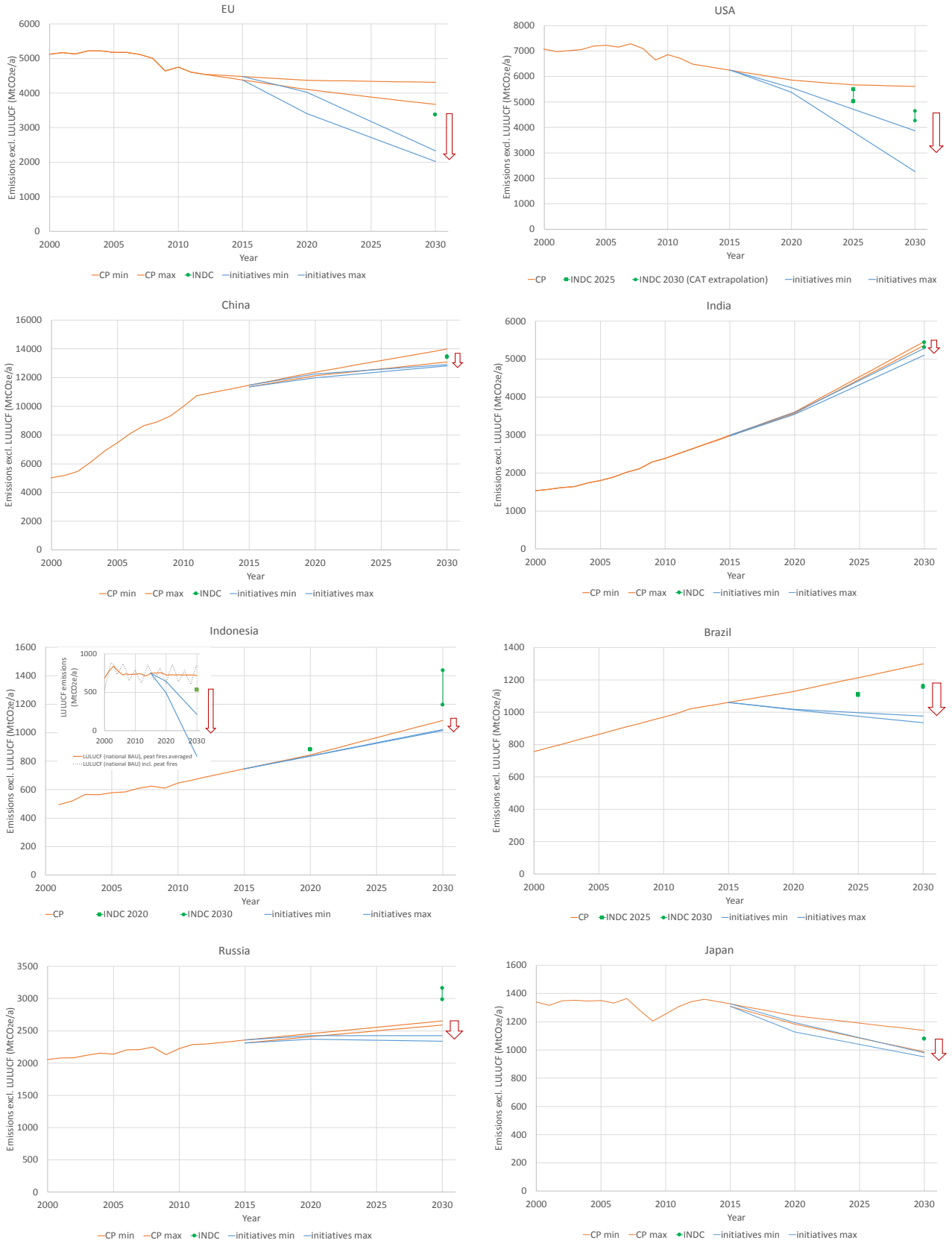
- Higher than the sum of the initiatives' contributions in each of the eight countries plus the worldwide-only initiatives, as it involves an estimation of the contribution to the rest of the world that has not been explicitly used anywhere else;
- Lower than the sum of the initiatives' contributions to the potential overall impact, since no overlaps were taken into account in that analysis.

Since the country-level analyses include not only an assessment of the overlaps between initiatives within and across sectors, but also of the overlap with INDCs – either by comparison to INDC scenarios (OECD & IEA 2015, New Policies Scenario) or by explicit comparison to quantified goals stated in a country's INDC – these globally aggregated numbers together represent the contribution, assuming full implementation, of these initiatives to global emission projections in addition to what would be expected under successful implementation of INDCs.

In Figure 4-6, we plot these aggregated contributions in 2020 and 2030 along with historic data of worldwide impact and future projections under current policies (i.e. without INDC levels) and under projections assuming full implementation of INDCs (Climate Action Tracker 2015). We have also compared these potential reduction levels with those required for a pathway consistent with limiting temperature rise to maximum 2°C above pre-industrial levels. It can be seen that the maximum contribution of these initiatives (i.e. under the most opti-mistic assumptions of emission reductions and assuming the initiatives are maximally additional to each other) would just fall short of reaching the median of the 2°C pathways. Figure 4-6 also shows how the individual initiatives are expected to contribute by 2030.

To clarify the flow of calculations by which we arrive at this worldwide impact, in Figure 4-7 we show a Sankey diagram to explain this. It details how the calculation flow goes from the "potential impact" numbers (on the left, here divided by thematic area for ease of reading) to the country-level disaggregation, where overlaps are calculated between initiatives and with INDCs (middle, showing how the "outflow" – rep-resenting reductions after overlaps – are smaller than "inflow"), and finally to the global-level impact aggre-gated back from a country-level. Numbers presented in this graph refer to the 2030 impact.

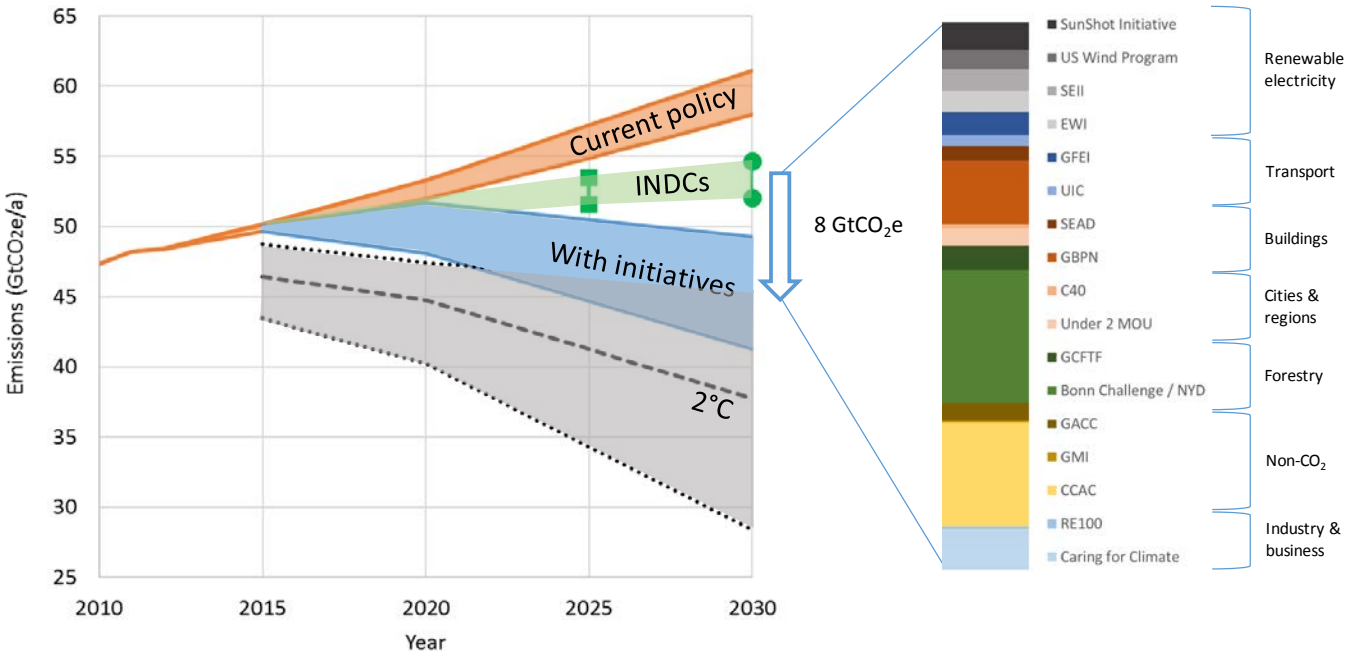
Figure 4-5 Overview of potential emissions reduction from initiatives in each country



Note: Initiative's potential reductions in the EU, USA, China, India, Indonesia, Brazil, Russia and Japan. Emissions excl. LULUCF; inset for Indonesia presents LULUCF historical data and potential reductions.

Source: Author's own calculations (initiatives), Climate Action Tracker (2015) (current policies, INDCs)

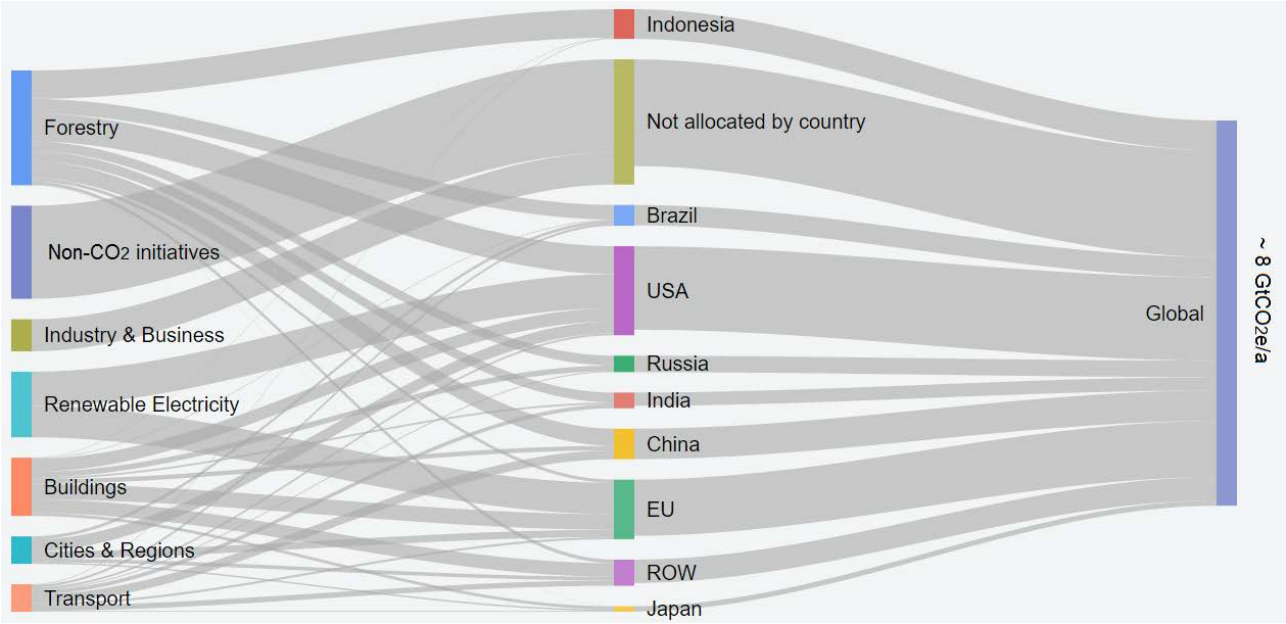
Figure 4-6 Global emission (incl. LULUCF) and emissions reduction from initiatives



Note: Global emission levels incl. LULUCF (historic, future under current policies, and future under INDC levels) along with the potential overachievement of INDC levels by the analysed initiatives scaled up to the global level. The dashed (dotted) lines indicate the median (10th/90th percentile values) of global 2°C compatible pathways (CAT, 2015). Right: Disaggregation of the contribution of initiatives overachieving INDCs by initiative in 2030 (average number shown). The two CCAC sub-initiatives we analysed (on HFC and CH4 reduction, respectively) have been grouped together under "CCAC". Initiatives with less than 10 MtCO2 expected contribution (ABAOCP and ULCOS) are not in the legend as they are not visible in the graph.

Source: Author's own calculations (initiatives), Climate Action Tracker (2015) (current policies, INDCs)

Figure 4-7 Flow of emissions reduction from initiatives per sector and per country



Note: Sankey diagram showing the calculation flow from global potential impact per sector (left) to country-level disaggregation (right) to global calculations. "ROW" = Rest of World; "Not allocated by country" refers to the initiatives analysed solely on the global level, or for which the overlap calculations were only done on the global level (CCAC and GMI). The numbers that flow "into" a country represent the average potential impact (i.e. without overlap between initiatives) compared to INDC levels. The numbers that flow "out" of a country represent what would be left over if the average level of overlapping is assumed. In this graph all information refers to 2030 impacts.

Source: Author's own calculations

5 Good practice analysis

In addition to the quantitative assessment, we also analyse potential qualitative contributions of initiatives. These are grouped into indirect impacts on GHG emissions (e.g. informational diffusion, political effects, technology development), co-benefits (e.g. air pollution, health impacts, energy security, economic development) and whether an initiative directly causes emission reductions through projects on the ground.

Both the quantitative and the qualitative assessment then provide the basis for a good practice analysis. The goal of the good practice analysis is to find overarching success factors, i.e. characteristics of initiatives that tend to lead to large emission reductions and/or high qualitative contributions. The characteristics assessed are topic area, geographical coverage, type of initiative, functions, type of member organizations and the existence of a permanent secretariat.

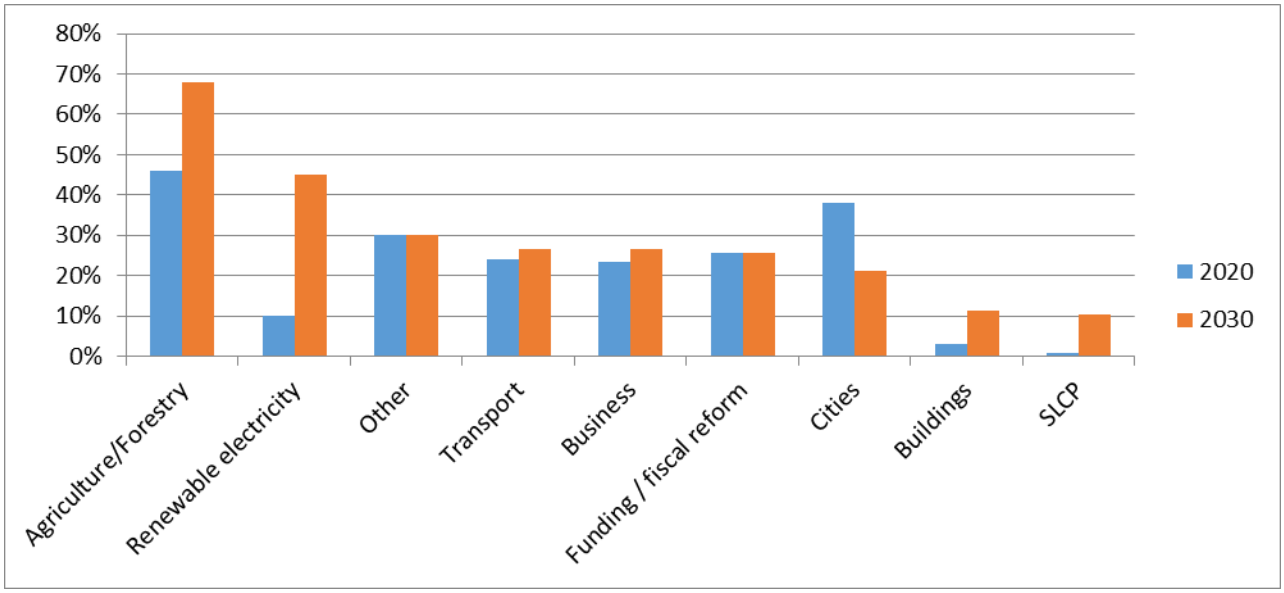
For each characteristic, we then calculate the correlation (correlation coefficients r) with quantitative and qualitative impact indicators, as well as the means of the impact indicators under different characteristics. As quantitative impact indicators, we use the global potential impact in 2020 and 2030, both absolute and relative to the total emissions covered by an initiative, as well as the achieved emission reductions to date. As qualitative impact indicators, we use the number of indirect impacts by an initiative, the number of co-benefits, and whether an initiative directly causes emission reductions. Finally, we derive success factors and good practice initiatives.

It is important to note that the number of initiatives with a target allowing for quantification in section 4 is too low for a solid statistical analysis. Therefore, while the results presented in this section are descriptive of this set of initiatives, they do not apply to climate initiatives in general.

5.1 Results

We start the analysis by comparing the quantitative impact by topic area. Figure 5-1 shows the mean of the relative global potential impact of all initiatives in a certain topic area.

Figure 5-1 Mean of relative global potential impact by topic area

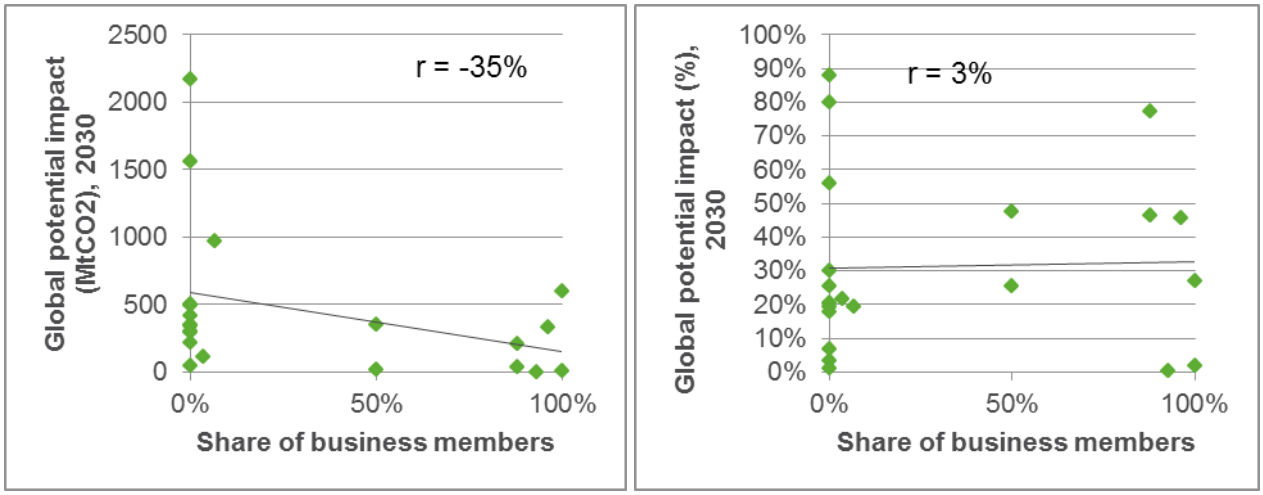


Source: Author's own calculation

We find that forestry initiatives have the highest impact in 2030. Forestry is not comprehensively included as a mitigation option in INDCs (Zeleke et al. 2016) and existing targets suffer from a lack of clarity (Petersen, K. & Varela, J. 2015). Therefore, initiatives play an important role in this topic area and their targets easily surpass national policies and INDCs. Further, we see that city initiatives have a large impact in 2020, but the impact in 2030 is much smaller. This indicates that most cities set rather ambitious short-term targets, but are more hesitant with long-term commitments.

Another interesting finding concerns the role of business members. Figure 5-2 shows the quantitative impact in 2030 in relation to the share of business members for each initiative. The left figure shows the absolute impact in $MtCO_2e$ and the right figure shows the relative impact as a share of the covered emissions of the initiative in percent. Each point represents one initiative. Furthermore, the figures show a linear fit to the data points and the corresponding correlation coefficient r.

Figure 5-2 Absolute and relative impact of initiatives in 2030 and their share of business members



Source: Author's own calculation

We find that initiatives with a high share of business members tend to be smaller, in terms of total emissions covered, than other initiatives, but have a similar relative impact. Further, analogous analyses reveal that those initiatives tend to more directly cause emission reductions than other initiatives, and that those initiatives are also associated with indirect impacts on emissions, mainly through technology development.

We have performed similar analyses for all characteristics mentioned at the beginning of this section. Many characteristics showed no apparent connection to the quantitative and/or qualitative impact of an initiative, notably geographical coverage and the type of an initiative (e.g. implementation, political or technical dialogue, intergovernmental process). However, some further success factors can be derived:

The first success factor is the presence of NGOs. We find that NGO-led initiatives tend to have a high relative impact both in 2020 and 2030 (r = 50% (2020), 37% (2030)). Further, initiatives with a high share of NGO members tend to have large co-benefits (r = 21%, highest correlation among member organization types), mainly health impacts and biodiversity.

Additionally, we find that voluntary agreements tend to have a high relative impact in 2020 (r = 58%, highest correlation of all initiative functions). However, the connection is less strong, but still positive, for 2030 (r = 22%).

Finally, we find that a permanent secretariat may support a high impact of an initiative. The existence of a secretariat comes with above-average absolute and relative impact in 2020 and 2030, and with already achieved emission reductions. It also indicates more indirect impacts and more co-benefits. However, the disclaimer is especially important for this characteristic: only four of the initiatives in our quantified sample have a permanent secretariat.

5.2 Good Practice Initiatives

In this section, we describe three good practice initiatives, which we have derived from the set of quantified initiatives. These three initiatives combine high impact with several of the success factors developed in the previous section.

The first good practice initiative is the combination of the Bonn Challenge and the New York Declaration on Forests, calling for the restoration of 150 million hectares of deforested and degraded lands by 2020, and an additional 200 million hectares by 2030. We estimate the potential impact of the initiative to be between 250 $MtCO_2e$ and 680 $MtCO_2e$ in 2020 and between 1.2 $GtCO_2e$ and 3.2 $GtCO_2e$ in 2030. The initiative covers an area, forestry, which is underrepresented in INDCs (Zeleke et al. 2016). It further covers a wide range of countries and is therefore a truly global initiative. In addition, it has a permanent secretariat and is based on voluntary agreements. Finally, the website of the Bonn Challenge[6] provides detailed descriptions of their activities, an own estimation of their impact, and provides guidance for potential new members.

Second, the Global Fuel Economy Initiative (GFEI) aims to halve the fuel consumption of the light-duty vehicle fleet in 2050 compared to 2005 (in litres of gasoline equivalent per 100 km). In the short-term, the initiative targets a halving of fuel consumption for new cars by 2030. The potential impact is estimated at roughly 160 $MtCO_2e$ in 2020 and 360 $MtCO_2e$ in 2030. As a transport initiative, the GFEI has considerable co-benefits, mainly in the reduction of air pollution and the associated health impacts. Further, the initiative also has a permanent secretariat and substantial NGO involvement. Finally, as a research and awareness raising initiative it nicely targets the long-term shift needed in the transport sector.

Third, the member companies of the RE100 initiative commit to 100% renewable electricity by a certain target year. We estimate the potential impact at between 17 $MtCO_2e$ and 34 $MtCO_2e$ in 2020 and between 24 $MtCO_2e$ and 50 $MtCO_2e$ in 2030. The RE100 initiative is a collection of voluntary agreements by businesses and led by an NGO, The Climate Group. As a renewable electricity initiative, it also causes large co-benefits in air pollution and energy security. The relative impact of the initiative is quite high, estimated at 77% in 2030. Finally, the initiative is very transparent on its targets and achievements, as the website provides concrete targets and current data for almost all member companies.

6 International initiatives and the UNFCCC

In December 2015 Parties adopted the Paris Agreement at the 21st session of the UNFCCC. In its Article 2 governments agreed to limit global warming to "well below 2°C above pre-industrial levels" and to pursue to limit it to 1.5°C (UNFCCC 2015). The UNEP Emissions Gap Report 2015 showed that a gap of 14 $GtCO_2e$ exists for 2030 between the mitigation proposals submitted by Parties as part of their INDCs and a pathway compatible with holding temperature increase below 2°C (UNEP 2015b). Based upon the outcome of the quantitative assessment undertaken in section 4, it is clear that international initiatives have the potential to help support the mitigation efforts of national governments.

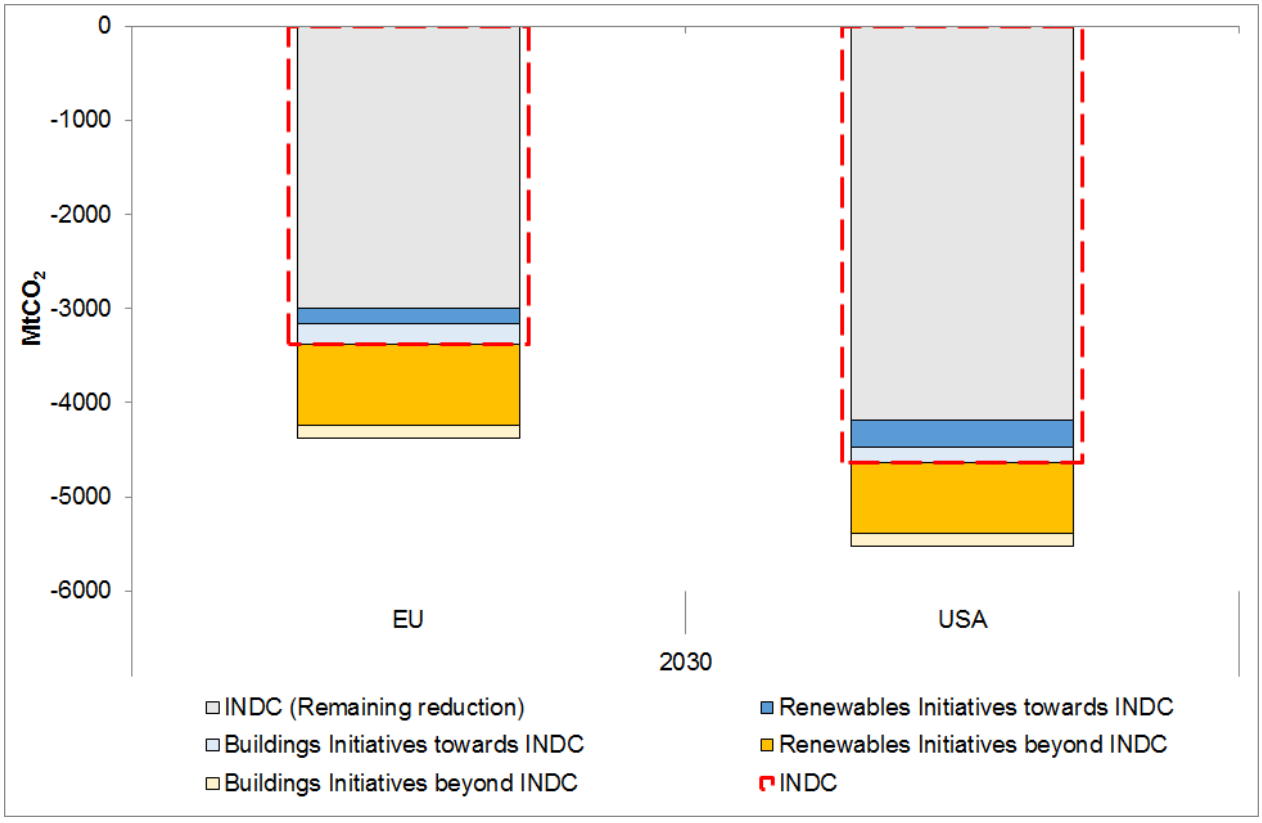
Given the potential of international initiatives to support and enhance the mitigation efforts of national governments, the Paris Agreement specifically refers to their role within the UNFCCC framework. Decision 1/CP.21 which adopts the Paris Agreement includes a section on non-party stakeholders (refer to paragraphs 118-120 and 134-137), 'welcoming' their efforts to address and respond to climate change (UNFCCC 2015). The Paris Agreement 'invites' non-party stakeholders to scale up their abatement efforts and demonstrate their activities via the Non-State Actor Zone for Climate Action Platform (UNFCCC 2015).

[6] http://www.bonnchallenge.org/

The emission reductions associated with the international initiatives reviewed in this study could, if achieved, contribute considerably to the existing INDCs in 2030 pledged by Parties to the Paris Agreement. For example, the European Wind Initiative and the Solar Europe Industry Initiative could collectively contribute up to 165 $MtCO_2$ towards the EU's renewable energy target in 2030 (included within the EU's INDC). While this by itself does not lead to additional reductions it is by no means guaranteed that all governments will be able to achieve their INDCs on their own. For the process as a whole it is important that the INDCs are credible and will be achieved; if not, there is a high danger of losing the momentum generated through the Paris Agreement.

Figure 6-1 illustrates the potential GHG impact of a selection of initiatives (from the energy and building sectors) towards the achievement of the INDCs in the EU and the USA by 2030. A key assumption underlying the analysis is that the new policy scenario from the WEO is sufficiently ambitious in order to meet the INDCs set for both countries in 2030. The contribution of the selected initiatives (from the energy and building sectors) towards the INDCs is the difference between the GHG reductions calculated for each initiative relative to the WEO current policy scenario baseline and the GHG reductions calculated for each initiative relative to the WEO new policy scenario baseline. The contribution of these initiatives to the INDC of both the EU and the USA in 2030 are represented by the dark blue (energy) and light blue (building) bars in Figure 6-1. The dark orange (energy) and light orange (building) bars represent the contribution of a selection of initiatives to GHG reductions beyond the 2030 INDCs, which are calculated as GHG reductions that exceed the WEO new policy scenario baseline. The relatively large contribution from renewable initiatives demonstrates the greater level of ambition of these policies compared to current expectations, if achieved.

Figure 6-1 Potential contribution of initiatives towards the achievement of the 2030 INDC for the EU and the USA and their contribution on GHG reductions beyond the INDCs.



Note: Initiatives include the EWI, SEII for renewables and the GPBN and SEAD for buildings
Source: OECD & IEA (2015), Own calculation

Figure 6-1 shows that in addition to supporting national governments with the achievement of their existing INDCs, international initiatives may also provide encouragement for increasing INDC targets as part of the

global stock-take every five years based on their mitigation impacts. Especially mitigation targets of international initiatives which go beyond current government planning may provide additional evidence to inform national governments on whether or not to increase their INDC target. By engaging more closely with key stakeholders, national governments may learn from the experiences of international initiatives and develop better policies to overcome common barriers and realise the abatement potential that exists in many sectors of the economy. Indeed, international initiatives may have great levels of expertise in certain sectors that are not well understood or influenced by government policies.

The previous quantitative analysis (see section 4) provided an illustration of how international initiatives could raise INDC ambition levels by assuming that the associated mitigation effort is entirely additional to state action. In the case of the EU the additional mitigation effort from international initiatives could raise ambition levels from at least 40% below 1990 levels in 2030 (European Union 2015) to over 60%. The United States' 2030 emissions could reach 55% below 2005 levels compared to their INDC target of 26-28% below 2005 levels in 2025.

The challenge is how best to integrate these efforts into the UNFCCC process, with the adequate support and incentives in order to ensure that international initiatives play an important role in mitigation actions. Two possible means by which the UNFCCC could support the efforts of international initiatives include:

Increase transparency of reporting: The mitigation efforts achieved by international initiatives will only be credible if they can be transparently accounted for. The UNFCCC or another international body could encourage consistent reporting, e.g. by developing a template, that includes the following key information:

- Scope, gases, sectors, stakeholders, updates
- Actions done/planned by initiative
- Impacts (assumptions, data, projections, CO_2 reduction potential, methodology)
- Current status, regular updates. Update should be in-depth every five years in time for stock take/INDC review (i.e. 2018 and every 5 years from then on).

Financial support linked to criteria: International initiatives may be supported in their mitigation efforts by the use of UNFCCC funds, which is specifically referred to in the decision to give effect to the Paris Agreement (UNFCCC 2015, para. 58). Access to financing from the Green Climate Fund and the Global Environment Facility by international initiatives should be linked to certain criteria such as:

- Transparent reporting based on a future reporting template for initiatives
- Initiatives can prove that they have an impact beyond INDC levels of ambition
- Initiatives are considered to be following good practice

The recommendations above address two potential limitations associated with international initiatives, namely (a) that initiatives do not deliver on their mitigation objectives and (b) that initiatives are not sufficiently incentivised to engage in the UNFCCC framework and contribute to new solutions in order to address and respond to climate change. By improving the transparency of reporting and providing financial incentives for good practice, it is envisaged that the UNFCCC can play an important role in supporting the mitigation efforts of non-party stakeholders. Furthermore, the UNFCCC can establish platforms to facilitate exchanges of information between party and non-party stakeholders to collaborate together to raise levels of ambition. Indeed, if the efforts of international initiatives were considered within the five yearly reviews of INDCs this would provide an excellent way for non-party stakeholders to show their mitigation impacts in order to influence greater ambition from national governments in the setting of future INDCs targets.

7 Bibliography

Climate Action Tracker (2015): Climate Action Tracker. Available at http://climateactiontracker.org/, last accessed on 17 May 2016.

Climate and Clean Air Coalition (2016): INDCs with SLCPs, last accessed on 15 Jul 2016.

European Union (2015): Intended Nationally Determined Contribution of the EU and its Member States: Submission by Latvia and the European Commission on behalf of the European Union and its Member States. Available at http://www4.unfccc.int/submissions/INDC/Published%20Documents/Latvia/1/LV-03-06-EU%20INDC.pdf, last accessed on 18 May 2016.

Lee, Carrie; Chandler, Chelsea; Lazarus, Michael & Johnson, Francis (2013): Assessing the Climate Impacts of Cookstove Projects: Issues in Emissions Accounting. Available at http://sei-us.org/Publications_PDF/SEI-WP-2013-01-Cookstoves-Carbon-Markets.pdf, last accessed on 17 May 2016.

OECD & IEA (2015): World Energy Outlook 2015: OECD Publishing. Available at http://www.worldenergyoutlook.org/weo2015/, last accessed on 17 May 2016.

Petersen, K. & Varela, J. (2015): INDC Analysis: An Overview of the Forest Sector. Available at http://wwf.panda.org/wwf_news/?257883/INDC-Analysis-An-Overview-of-the-Forest-Sector, last accessed on 20 May 2016.

Roelfsema, Mark; Mathijs Harmsen; Jos Olivier & Andries Hof (2015): Climate Action Outside the UNFCCC - Assessment of the Impact of International Cooperative Initiatives on Greenhouse Gas Emissions. The Hague. Available at http://www.pbl.nl/sites/default/files/cms/pbl-2015-climate-action-outside-the-unfccc_01188.pdf, last accessed on 17 May 2016.

UNEP (2015a): Climate commitments of subnational actors and business: A quantitative assessment of their emission reduction impact. Nairobi. Available at http://apps.unep.org/redirect.php?file=/publications/pmtdocuments/-Climate_Commitments_of_Subnational_Actors_and_Business-2015CCSA_2015.pdf.pdf, last accessed on 20 May 2016.

UNEP (2015b): The Emissions Gap Report 2015: A UNEP Synthesis Report. Nairobi. Available at http://uneplive.unep.org/media/docs/theme/13/EGR_2015_Technical_Report_final_version.pdf, last accessed on 20 May 2016.

UNFCCC (2015): Adoption of the Paris Agreement: Decision 1/CP.21. Available at http://unfccc.int/documentation/documents/advanced_search/items/6911.php?priref=600008831, last accessed on 20 Jan 2016.

Zeleke, A.; Phung, T.; Tulyasuwan, N.; O'Sullivan, R.; Lawry, S. & Gnych, S. (2016): Role of Agriculture, Forestry and Other Land Use Mitigation in INDCs and National Policy in Asia. Available at https://www.winrock.org/wp-content/uploads/2016/05/AFOLU-LEDS-Working-Group-Techincal-paper-Role-of-AFOLU-mitigation-in-INDCs-and-national-policy-in-Asia-1.0-Feb-25-2016.pdf, last accessed on 20 May 2016.