

Synergies between EE, RE and CO2 targets

DIW Berlin Workshop Report, Karsten Neuhoff

24.4.2013, Draft for comments

The low price for CO2 allowances in the EU emission trading scheme has triggered a wide discussion on interactions between ETS, efficiency and renewable targets and policies. Behind this debate are concerns about what happens next, both under the existing targets and instruments and in the formulation of different targets for the period post 2020. The uncertainty around the nature of future targets increases risks around the return profile of new energy investments, and holds back investment strategies.

To explore questions around targets, as a step to increase predictability for investments, DIW Berlin, supported by Eurelectric, hosted a workshop on the synergies between EE, RE and CO2 targets on September 28th, 2012. This brought together perspectives from utilities in the gas and power sector, policy makers, and academics. This Workshop Report provides a summary of ideas, analysis and potential ways forward that emerged from the discussions.

Summary of insights

Multiple targets

- Climate and non-climate related policy objectives are parallel drivers for RE and EE targets and as such need to be reflected in the analysis and process of target formulation.
- Policy makers, stakeholders, and experts in different sectors focus on specific targets. There is a need for the development of a shared understanding of the role of multiple targets.
- Coherence of targets is not a requirement but can serve as a guiding principle.

Formulation of targets

- Retaining options (e.g. scope and time-horizon) for the formulation of targets can provide flexibility for political compromise.
- Discrepancy between short-term targets and long-term needs can capture attention and public support for formulation of satisfactory targets.
- Enhancing the predictability of future adjustments to targets enhances their impact for private investors.

Structure of the report

Policy targets can be seen as an interface between political objectives and specific policies and programs (Figure 1):¹

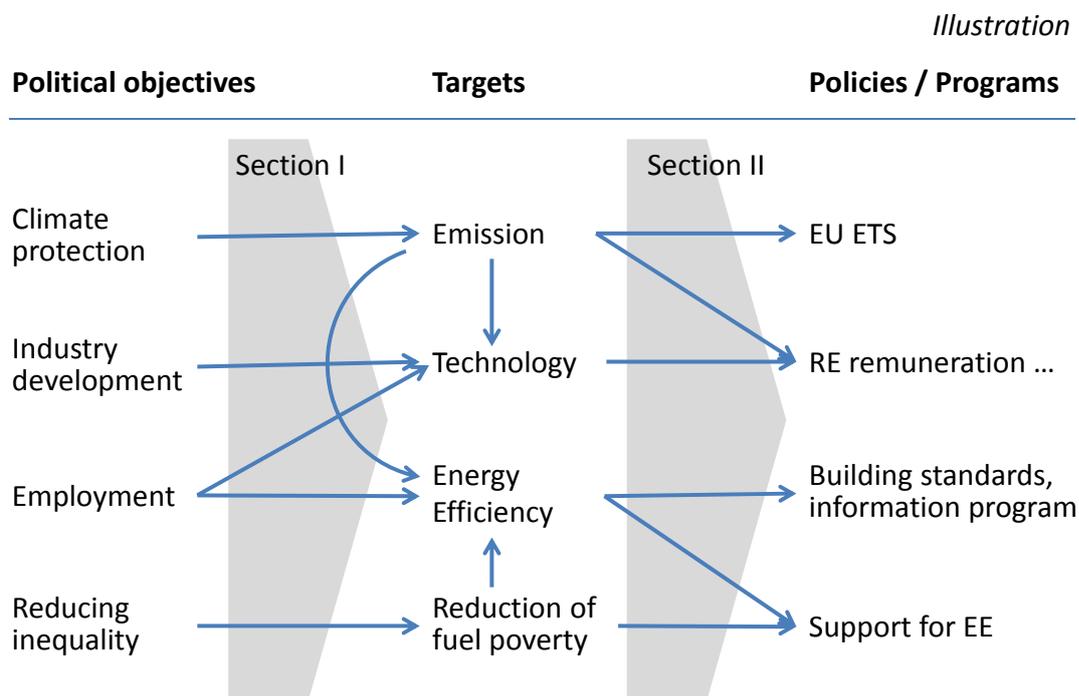


Figure 1: The role of targets as interface between political objective ad policies and programs

This characterization underpins a clear analysis of targets. We explore in section I the link from political objectives to emission, renewable and efficiency targets, followed by section II with a discussion how the targets can provide guidance for policy makers to implement and manage policies and programs and to provide visibility for companies to inform strategic and investment choices. The specific nature of EU ETS – as a target incorporated in a policy instrument - is discussed in section III. The analytic framework then provides the basis for the discussion of implications for the possible formulation of energy and climate targets in section IV.

¹Enquete-Kommission "Nachhaltige Energieversorgung unter den Bedingungen der Globalisierung und der Liberalisierung" des 14. Deutschen Bundestages: Endbericht. Drucksache 14/9400. Bonn: Bundesanzeiger Verlagsgesellschaft, 2002.

I. Translating political objectives into targets

- **Multiple drivers exist for targets, this can explain incoherence across targets**
- **Multiple drivers for targets contribute to the resilience of targets**
- **We require shared understanding on the motivation for targets if we are to increase the predictability of their future adjustments**

Targets are derived from multiple policy objectives

Societies pursue multiple policy objectives, of which climate only is one aspect. Typically, objectives like securing economic development, creating employment opportunities and addressing social hardship are of very high priority for policy makers. Also these policy objectives are translated into explicit or implicit targets on economic growth, unemployment figures and minimum income levels.

With multiple policy objectives motivating a target, the precise definition of the target as well as the ambition level embedded in the target will reflect the relative importance attributed to the different policy objectives. Industry development and climate policy objectives might motivate the support of a portfolio of renewable energy technologies, but also threaten the profitability of generation assets of incumbent utilities. In the end, targets reflect a political compromise. So, political, social and economic circumstances will ultimately determine the outcome of the debate.

National targets can also be used to coordinate international cooperation, for example as part of EU energy policy or international cooperation, to tackle global climate change.

Climate policy objectives motivate multiple targets

In EU climate policy, multiple policy objectives exist even for routes to achieve climate goals and seem to have determined the design and ambition of different targets, as below:

Emission target: The climate policy objective to limit the probability of exceeding 2C global temperature increase has been translated into a European emission reduction target of 80-95% by 2050. Extensive modeling work demonstrates the economic feasibility of this long-term target. A minority group of actors questions whether to pursue this target unilaterally, based either on skepticism about climate science or a disregard of moral responsibility for the harm their emissions will impose on others.

Emission trajectory: The 2050 emission reduction target can in principle be achieved with particularly steep reductions of the emission trajectory at the beginning or end of the period. However two factors need to be considered. First, the dynamics of technology development and the inertia of energy-, transport- and building infrastructure restrict the possible emission trajectories. Without significant action prior to 2030, it will be difficult to subsequently pursue the investment to achieve a 2050 target and would risk to leave many carbon intensive investments stranded. Second, carbon emissions accumulate in the atmosphere. Thus if emission reductions are postponed, this contributes to an increase of atmospheric CO2 concentration, jeopardizing the 2C policy objective.

As part of the EU Energy and Climate package, an emission trajectory has been defined. The European 2020 emission reduction target of 20% relative to 2005 is part of EU legislation. The EU ETS

directive furthermore describes the emission trajectory with a linear reduction factor that applies post 2020.

Multiple targets for transformational activities: Shorter-term emission reduction targets, e.g. for 2020, can in principle be achieved with a focus on on-shore wind generation and the pursuit of simple efficiency measures across a large share of buildings. To deliver the longer-term emission reduction targets, however, a larger portfolio of renewable energy technologies and of (deep) efficiency improvements will be necessary.

Without successful commercialization and deployment of the technologies at a sufficiently early period, together with appropriate preparation of the complementing (grid) infrastructure, it is unlikely that these technologies could subsequently make a large contribution. This suggests the importance of translating longer-term emission reduction targets into a subset of shorter-term targets to ensure commercialization and early deployment of a set of technologies and practices required for the low-carbon transformation.

For targets to become effective, they do need to guide the design and implementation of policies.

II. Translating targets into action

- **A target's time frame and scope should match the requirements for effective implementation of corresponding policies and programs.**
- **Design of targets matters for decisions on, and coordination of, private sector investment.**

Targets have two main functions – to provide guidance to policy makers for implementation and management of policies and programs and to provide visibility for companies to inform strategy and investment choices.

The role of targets for policies and programs

Inside government, targets drive policy and program development and refinement, as governments are accountable for delivering against the targets. Thus targets provide an effective framework to monitor policy performance and manage policy implementation. This is perhaps most clearly spelled out in the Climate Change Act in the UK, mandating the Climate Change Committee to monitor and report not only on the delivery against targets but also to assess whether policies in place are sufficient to achieve climate change objectives.

In this context, a subtle difference exists between the political culture in Europe and the US. European governments consider delivering against targets as indicator for responsible government (political culture). There are some legal enforcement mechanisms at the EU level, but usually with only minor financial implication, if any. In contrast, the US government can be sued where targets are not achieved.

In either region, the expectation is that targets agreed by government reflect a choice of a country and will be honored also after a change of government. In contrast, the specific policies and programs used by governments to deliver against targets are more political in their nature. Thus

there can be competition between different policies proposed by different actors – who may be successful in different circumstances and time periods - as means to achieve the target.

Pillar of policy/ response	Dominant timescale / Domain	Decision framework	Field of theory	Mitigation economic process	Realm of opportunity
Standards and engagement (Pillar I)	Short term – <i>Ignore / satisfice</i>	Diffident or disempowered	Behavioural & Organisational	Move closer to the ‘best practice frontier’	‘Smarter choices’
Markets and pricing (Pillar II)	Medium term – <i>Optimise</i>	Costs / impacts are tangible and significant	Neoclassical & Welfare economics	Make best trade-offs along the frontier	Substitute cleaner production and products
Strategic investment (Pillar III)	Long term – <i>Secure/ Transform</i>	Transformational risks and opportunities	Evolutionary & Institutional	Evolve the frontier	Innovation and infrastructure

Figure 3: The ‘policy pillars’ required to exploit the realms of opportunity, based on fields of theory²

Multiple targets for different types of policies

As a consequence of the range of policy objectives inherent in the climate discussion, it may not be sufficient to translate the climate objective only into one long-term emission target. In addition to a trajectory or milestones, more detailed policy objectives are also required, e.g. on technology or efficiency related aspects. These objectives may also need targets to ensure the necessary transformational activities are pursued and coordinated. Figure 3 structures policies in three groups. They comprise (i) standards and engagement to support smart choices by individuals and organizations (ii) markets and pricing to encourage substitution to cleaner production and products and (iii) strategic investment to unlock innovation and provide complementing infrastructure.

The different types of policies that are used also imply different time frames for which a respective target needs to be relevant. It suffices to define targets for time periods of a few years where the purpose of the target is to guide the implementation of standards and information programs to encourage households and organizations to make smarter choices. In contrast, targets need to be defined for relatively long time frames where they are to provide guidance for public lead investments innovation and infrastructure

In a first approximation one might link energy efficiency targets to the policies and programs under pillar I, the emission target and price formation embedded in EU ETS to pillar II, and renewable energy targets to pillar III.

The success for a new technology hinges as much on its perception in society as on its economic and technological characteristics. This implies that a target for innovative technologies, e.g. for renewable

²Grubb et al. (forthcoming), Planetary Economics and the Three Domains of Sustainable Energy Development. London: Routledge.

energy or CCS, needs to support the implementation of policies and programs necessary to deliver a technology in society. This does comprise many uncertainties, and might therefore require adjustments with the experience gathered over time.³

The role of targets for private sector investments

Targets to guide private sector investment In principle, it is not targets but only the policies and programs implemented by governments to deliver targets that will impact on private decisions. However, where investors or private households decide on investments or on strategic choices - like education and training or product development --- they will take a longer term perspective beyond the currently implemented set of policies. Here targets can be of help. The more specific and credible targets are, the more effective they will be in influencing these decisions.

For example, the European 20% Renewable Energy target has been allocated to Member States and translated into technology-specific deployment trajectories so has contributed to an increasing confidence in future demand for several of the renewable technologies. Thus, it was the basis for investment and innovation by actors in the supply chain.

Multiple targets to facilitate coordination: Shifting investment towards more efficient and low-carbon technologies often requires coordination across multiple public and private actors. This is best illustrated by the various policy initiatives on grid investment and operation, permitting and financial support that are triggered by the EU Renewables Directive. Experience suggests that specific targets provide a framework to coordinate the necessary action across all actors towards a more specific goal, and also formulates a mandate for public policy makers to pursue the necessary activities.

III: The role of EU ETS – a target turned instrument

- **EU ETS provided a clear link from targets to business reality, thus encouraging companies to take political targets serious.**
- **Value of ETS is the delivery of carbon price with potential for upside development, making companies aware of the risk of carbon-ignorant investment choices.**
- **Emission targets embedded in ETS remain political decisions, and therefore adjustments need to be possible without undermining the trust in the instrument.**

EU ETS deserves special attention because it has a dual role. It incorporates an emissions target and trajectory – but also translates this into a carbon price that has tangible impacts for market participants. However, an effective EU ETS is only part of a policy mix necessary to facilitate a low-carbon transformation.

The impact of EU ETS on the perception of targets: The peculiar nature of EU ETS as both a target and an instrument has had a big impact on the perception, particularly in the energy and climate community, of the role of targets. EU ETS has likely increased the credibility of targets both for policy makers and for industry – but has also nurtured a sense that targets are set in stone. This in turn

³ If technology appraisal would be about technology, uncertainty should decline over time, but often uncertainty about the potential success of a technology increases over time, often related to social acceptance.

creates the risk that any adjustment of a target is interpreted as undermining the credibility of a target, rather than a reflection of a continued commitment to the policy objective embedded in the target that translated into a updating of the quantitative target in line with updated information on technology or economic conditions.

EU ETS captured attention of companies for long-term targets. The EU ETS turned policy targets into something tangible for private sector actors. While prior to 2008 long-term emission targets were seen as political statements with little relevance for business reality. The increasing attention dedicated to EU ETS combined with aspects like the discussion on the roadmap 2030, created the awareness that longer-term targets will and need to be considered in business decisions.

EU ETS can stop high carbon investments: Investment in technologies that only offer marginal emission reductions relative to long-term emission reduction requirements, for example higher efficient coal plants, will be a legacy that can create political obstacles and economic costs for further emission reductions post 2020.

EU ETS can provide a long-term framework constraining the unsequestered use of fossil fuels. It creates a tangible risk for high carbon investment, because the direct link between policy target and enforcement mechanism (carbon price) limits the scope for lobbying by incumbent companies. Hence with the phasing out of free allowance allocation, no new investment projects have been taken forward for coal power stations in Western Europe. The picture is not as clear in several of the new Member states that had negotiated exemptions allowing for continued free allowance allocation in the power sector.

However, with the accumulation of a large surplus of EU ETS allowances linked to unexpected high availability of international offset credits (CDM/JI) and unexpected low emissions caused by the economic crisis, the EU ETS allowance price has dropped to levels that have reduced its credibility and relevance, requiring both short-term responses like back-loading and longer-term structural reform.

IV: Possible implications for formulation of energy and climate targets

Coherence of targets is not a requirement but a guiding principle

For the future, a set of consistent targets is *a priori* very attractive for policy implementation and private sector investment and strategy choices. However this should not impose a requirement that targets have to be 100% consistent.

A strict requirement on 100% consistency would impose that a political discourse around the formulation of targets was focused on this objective.

- The quantitative analysis to assess whether a set of targets are 100% consistent is not necessarily an objective scientific result, but reflects subjective assumptions. Therefore it might be a subjective perception whether a set of targets is 100% consistent.
- The requirement of 100% consistency would limit the opportunities for political compromise – e.g. through flexibility on timing, sectoral scope, or process, that might be necessary to get an agreement on transformational policy.

- If the 100% consistency requirement puts too much pressure to compromise political positions this might undermine the credibility of targets that emerge. Targets that are more closely linked to the underlying objective shared by society might be more stable even though slightly inconsistent with other targets derived primarily from other objectives.

These challenges suggest that, in practice, consistency of policy targets could be more of a guiding principle that allows for some level of deviation. In this case trigger points and adjustment mechanisms need to be better understood such that they can be anticipated.

A similar discussion applies to the question of complexity of policies – as there might be trade-offs between consistency (e.g. avoiding double pricing of carbon) and complexity (the required sets of exemptions).

Discrepancy between short-term target and long-term needs can capture attention and public support for satisfactory targets

As individuals and societies we have a tendency to prioritize short-term over long-term needs. This is the fundamental challenge for climate policy. The level of emission reductions we are prepared to pursue in the short-term is significantly below the long-term requirements that we have accepted. This discrepancy crystallizes in the discussion on 2030 emission targets.

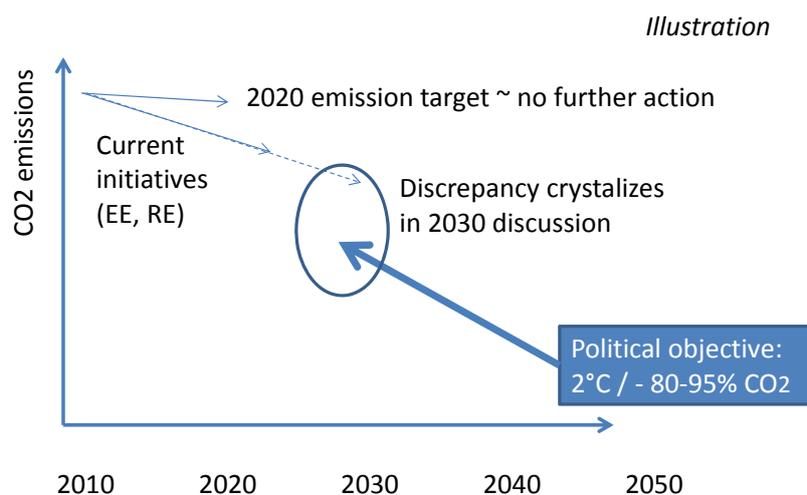


Figure 2: Discrepancy between climate objective and emission targets crystallizes in 2030 discussion

If we would be on track to achieve the long-term energy and climate targets, then we would not have a political discussion on targets, but technical negotiations on fine tuning the targets. It is the apparent discrepancy between long-term societal/political targets and current developments that provides the trigger for a political discourse on the targets.

Non-climate policy objectives are additional drivers for RE and EE targets – they should also be reflected in stringency of emission targets.

As the long-term target was translated into a 2020 emission reduction target additional policy objectives were touched. Of particular relevance in the debate on the target level was the anticipated negative impact on employment and profitability of incumbent companies and the ignorance of growth opportunities for new actors. As a result the 2020 emission reduction target was relaxed significantly, and is not consistent with the long-term climate objective.

In contrast, renewable energy and energy efficiency targets were not only motivated by climate objectives, but also by objectives relating to technology and industry development and reduction of costs for energy imports. Thus the resulting level of ambition embedded in the target is higher. This is going to deliver emission reductions exceeding the 2020 emission reduction target, but still not in line with the long-term climate policy requirements.

Retain options for formulation of future targets

It is important to retain options in the system to allow policy makers to build a policy framework consistent with emerging information. Such options can provide the space to allow for a political compromise to balance the political interests across the multiple policy objectives impacted.

This can involve the (re-)negotiation of a sub-set of targets one at a time, even at the cost of full consistency. This could address the limited capacity of the political process that might delay the simultaneous (re-)negotiation of all targets. Also, flexibility on time frames for different targets could provide additional flexibility. For targets that guide long-term investment choices in the power or energy intensive industry sector, the long-term perspective seems to be of higher importance than for other targets that are primarily aimed facilitating a better implementation of regulation and institutional choices (e.g. for energy efficiency in buildings). This could also create the space to facilitate learning on ability to deliver and thus find empirical evidence base to resolve discrepancies in analysis for example on the ability of policies and programs to unlock energy efficiency potentials.

Flexibility is also valuable to increase the space to find political compromises. In addition to compensation, that is established procedure at EU level, other options need to be considered. It is unlikely that future target setting can be left to automated mechanisms

Enhance predictability of future adjustments to targets

There is a concern that any adjustment of a target in the EU ETS is interpreted as undermining the credibility of targets in this area, permanently adding a layer of uncertainty. To increase the level of predictability of outcomes from future target negotiation processes:

- these negotiations could incorporate formulations that reflect minimum levels of certain attributes necessary for society.
- using individual targets, so tying target goals more closely to clear and specific policy objectives, can create some political resilience that increases stability of targets in the presence of changing importance attributed to different policy objectives.
- as the value of targets to coordinate public and private action increases with the confidence that the target will be achieved, prominent failures to deliver against targets can undermine the value of targets. This points to the subtle balance that needs to be struck in the formulation of targets – sufficiently stringent to achieve the political objectives while within the reach of policy action to be credible and effective.

A set of interactions can be identified across different policy domains – and thus targets. In this picture, the activity of policy makers on one pillar can also impact the success of other pillars. Pursuit of such activity can demonstrate political commitment to policy objectives, and thus enhance credibility of other policy targets derived from the same objective. For example EU ETS, and thus the emission reduction target, can be interpreted as a “base-load” instrument. The base load instrument

is complemented with dedicated short-term policies to unlock energy efficiency potentials, and policies oriented towards unlocking long-term potentials on innovation and infrastructure.

Develop EU ETS within understanding of broader framework of targets

In EU energy discussions, the overlapping responsibility between energy efficiency, renewable energy and ETS targets is often characterized as raising issues of significant concern.

- Emission reductions delivered through dedicated efficiency and renewable policy reduced the scarcity under EU ETS. However, as the EU Renewables Directive has been designed and implemented in parallel with the ETS directive this effect was already considered in the EU impact assessment during the formulation of the Directive (SEC 2008, 85/3.23.1.2008).
- With a significant share of emission reductions delivered through dedicated instruments and under targets for RE and EE, the elasticity of emissions to falling carbon prices is lower, therefore the overlap of policy instruments can increase the volatility of carbon prices. However, this argument presupposes that in the absence of e.g. dedicated energy efficiency policies addressing various market failures, the actors would adjust the level of energy efficiency measures they pursue in response to the carbon price.

Based on these points it is often argued that overlapping policy targets should be avoided.

However, most of the emission surplus under EU ETS can be attributed to factors not related to the nature of the policy targets. Instead three factors primarily responsible for the surplus are the unexpected high inflows of international off-set credits, resistance to implement the initially envisaged 30% reduction target and lower than expected emissions due to the recession. These factors had a stronger than expected impact on carbon prices due to the lower than expected capacity of the market to bank carbon allowances for future use.

A generic implication is that EU ETS needs space for learning by doing, and flexibility to respond to developments. A clear strategy is needed on where and what interventions are compatible with this objective and how to accelerate the necessary learning by doing process .

More specific implications will still have to be explored – they might involve a clearer formulation on the dimensions for which shorter-term adjustments can be allowed (e.g. allow for tightening of targets in simplified process), and of other dimensions that require longer-term stability (e.g. the definition of a carbon allowance in emission trading that is basis for commercial contracts,).

Avoid artificial simplicity for target framework that ignores the multiple drivers and objectives of targets

It is argued that the interaction between EU ETS and other policy targets requires a clear formulation of the hierarchy of policy targets (see e.g. Figure 4). However, the analysis to support this conclusion is focused solely on the climate policy objective as motivation for the set of targets, and also needs to be refined to better reflect the different time- frames and scope of the targets.

Therefore the discussions on EU ETS need to be expanded while considering both its target and instrument nature. The target nature is not holy, but requires a clear understanding on accepted flexibility (e.g. time-frames for tightening of targets). The general discussion on time frames or trigger points for adjustments also applies to, and might require further refinement in the context of EU ETS.

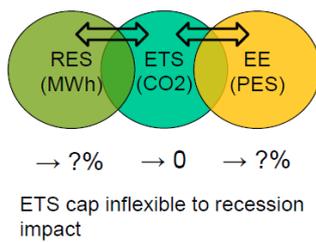
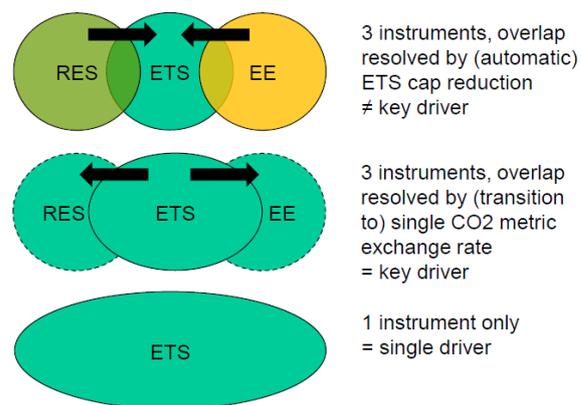
Power sector today...**Some future options...**

Figure 4: Eurelectric proposals to develop hierarchy of targets overlapping with EU ETS.

The instrument nature of EU ETS is reflected in discussion on a reserve price. There are potential conflicts between solutions that are suitable to address challenges with regard to instrument or target level only. For example a reserve price might hide a discrepancy emerging between emission levels and target levels that could otherwise trigger a political discussion on adjustments to the target level. Perhaps the design of a reserve price could re-introduce pressure on the other side –by exposing actors that are particularly strong in the political process (treasuries instead of international climate action departments) to revenue shortages due to reduced auction volumes at the time of binding reserve prices.

Develop shared understanding of role of targets

Perhaps there is no grand new design required – more a broader sharing of understanding. This may involve finding answers to a variety of questions, including these:

- How to shape the debate to first reach political agreements over various goals, and then debate how to build flexibility to balance these goals into targets, without reducing the strength of incentive they create for change?
- Over what time frames should targets be set?
- Adjust targets on a fixed intervals or in response to inconsistencies or political triggers?
- Future RE targets for all RE or only for new RE technologies?
- How to formulate targets to support infrastructure planning?
- How to make targets effective by making them politically salient?
- How to relate to other countries?
- How do public targets relate to company internal targets?