

Capacity Remuneration Mechanisms

Policy Briefing

July 2014

1. Introduction

Europe faces a great challenge: cost-efficiently decarbonizing the power sector by 2050, while continuing to ensure security of electricity supply. In line with the decarbonisation goal, European Member States need to significantly increase the share of variable renewable energy (VRE) in Europe's overall energy mix. In order to reach these goals, investments are not only needed in low-carbon technologies, but also in the flexible resources that help deal with the expected increase in supply variability. An adequate framework to effectively deliver the required investments, while simultaneously reaching all the above-mentioned goals (sustainability, security of supply and affordability), is missing. Which energy market design would be best suited to incentivise those investments is hotly debated. An increasing number of Member States have introduced, or are discussing the introduction of new regulatory instruments in the form of *Capacity Remuneration Mechanisms* (CRMs). These policy instruments alter the energy market by creating additional revenue streams for capacity, generally with the goal of securing system adequacy. If wrongly designed, they lead to distortions in the functioning of the market, leading to overcapacity, high prices for consumers, lock-in to high-carbon infrastructure and a high dependency on continuous regulatory intervention.

CAN Europe, in its latest working document *Towards a functioning low-carbon investment framework in Europe: the need to modernize increasingly prevalent traditional capacity remuneration mechanisms*¹, has analysed existing and potential CRMs, looking at their potential impacts on the functioning of the energy market and future investments. This briefing aims to briefly present the key conclusions, and to increase the understanding of this complex topic among environmental NGOs.

2. Are Capacity Remuneration Mechanisms necessary?

Given the combination of policy targets in Europe, we can largely divide the required investments into two groups. Firstly, significant investments in VRE will need to happen throughout the next few decades, providing the needed low carbon and sustainable assets². Secondly, investments that also need to happen in that also of policy (e.g. the remaining generation and demand-side resources, network infrastructure, etc). Ideally, the latter investments would go to assets that contribute simultaneously to the different policy targets³. In other words, it is important that the capacity that is fit for purpose stays in the system⁴, and that the market attracts new investments that have the capabilities needed to integrate the projected rising share of VRE in an efficient and cost-effective manner.

A system with high shares of VRE does not only require investments in flexible generation plants, but also in demand response capacity and storage (all of them are still lacking a proper investment framework, as their benefits are not well valued in the market. As explained in the CAN working

¹ *Towards a functioning low-carbon investment framework in Europe: the need to modernize increasingly prevalent traditional capacity remuneration mechanisms*, CAN Europe July 2014-
http://caneurope.org/resources/publications/position-papers/cat_view/318-position-papers-and-research/425-renewable-energy

² Although the question of how near-zero-marginal-cost renewable energy producers will recover their investment costs as their share of the energy mix keeps increasing is a very important one, that is not the focus of this analysis.

³ Possibilities include Generation and demand side assets that are low-carbon, affordable and flexible enough to ensure reliability

⁴ such as newly installed flexible gas-fired power plants

document⁵, flexibility can and should be triggered by the improvement of the national electricity markets (through intra-day balancing, shorter gate-closure times, more liquidity in the wholesale market, etc.), and the completion of the EU Internal Energy Market (larger coupled balancing areas, coupled market prices, higher levels of interconnection capacity, etc). However there is no clear consensus⁶ in the sector about whether these measures alone will be sufficient to trigger adequate flexibility and ensure system adequacy. The European Commission has tried⁷ to tackle this challenge and ensure Member States take a coordinated approach and decision on whether CRMs would be a good solution. Still, a growing number of Member States have taken the unilateral decision to introduce CRMs, mostly from a national perspective and without addressing the increasing need for flexibility.

CAN Europe believes that policy makers should concentrate their efforts on improving the energy-only market and achieving a single EU energy market. Although, it seems unlikely that the energy only market fixes will address the missing money problem⁸, thus delaying the future expansion of renewable energies.

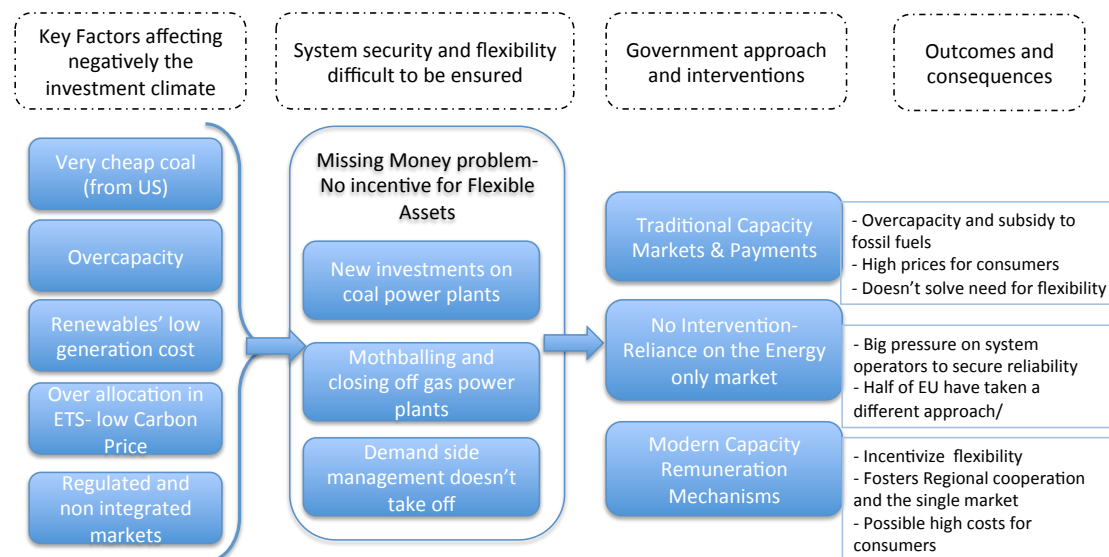


Figure 1. Government approaches to the current uncertain investment framework that may not deliver investment to security system security and promote flexibility

A revision of the current market model stimulates prospects of further change in the market setting, which increases investment uncertainty. Therefore, the sooner there is clarity about this, the better. CAN believes that *etraditional'* CRMs will not solve the multiple challenges that Europe's energy sector faces and they will create additional problems. However, if rightly designed, a '*modern'* CRM (as described in section 3) would contribute towards achieving Europe's multiple challenges, by better taking into account the electricity systems' needs that arise from variable renewables and other key external factors that are taking place (as shown in figure 1).

⁵ See footnote 1.

⁶ Stakeholders Forum on generation adequacy, European Commission, March 2013
http://ec.europa.eu/energy/gas_electricity/consultations/20130207_generation_adequacy_en.htm

⁷ Guidance on public intervention, Generation adequacy in the internal energy market, European Commission-SWD(2013) 438, November 2013

⁸ Missing money problem: money for flexible assets (both generation and demand capacity) is 'missing' in the sense that the energy market, that was designed to provide sufficient revenue (through short-term scarcity pricing) to incentivize long-term investments in adequate amounts of flexible capacity, does not delivered. The main reason is that spot prices in the wholesale market are capped (by regulators) to avoid skyrocketing prices for consumers and to avoid industry windfall profits.

Modern CRMs should not be seen as a replacement of other measures to improve the current energy market. Modern CRMs are important because, whether we agree or not that the energy-only market could deliver system adequacy, we are confronted by the fact that many Member States have already begun introducing *traditional* CRMs. These CRMs are creating additional problems for the proper functioning of the market.

3.Modern CRMs

Capacity Remuneration Mechanisms (CRMs) can be designed in a wide variety of ways. They can be price or volume based, they can be centralized or decentralized, market-wide or targeted to specific producers. They can be classified as a capacity payment, strategic reserve or as a capacity market. They can incentivize existing or new capacity⁹. In any case, the aim is traditionally the same: to reward capacity in order to ensure that demand can be met at any point in time. However, this does not regard the type of capacity and therefore they do not reward additional capabilities that could be offered to the system (for instance, fast ramp up times to compensate for sudden changes on generation from variable renewable energy sources). Under the current context, CRMs designed according to the traditional approach support inflexible and high-carbon generation assets such as coal-base power generation (since these type of plants can currently provide firm capacity at a lower cost).

Moreover, so far in Europe CRMs are designed from a national perspective, without considering the opportunities of providing adequacy through generation and demand assets in other Member States. Geographical considerations and the types of services that are incentivized, are the two main characteristics that distinguish *traditional* CRMs from *Modern* CRMs (see figure 2).

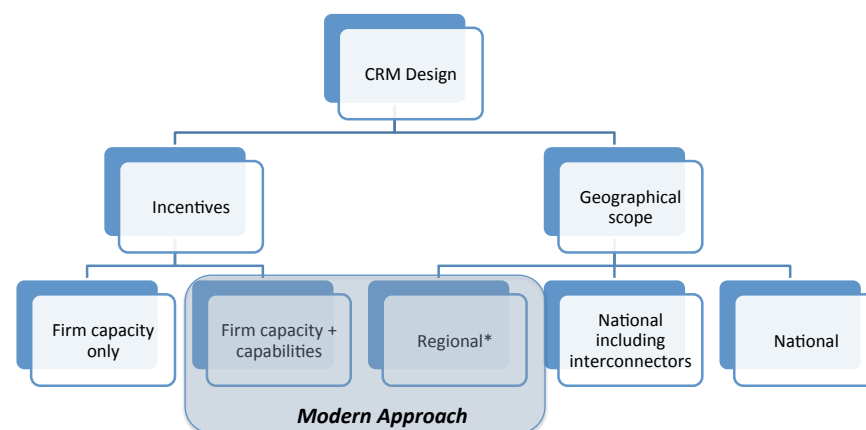


Figure 2. Graphical definition of modern CRMs in terms of incentives and geographical scope. *By “regional” we mean areas that cover more than one country.

Modern CRMs reward flexibility and capacity, and their scope includes markets beyond a single Member State. The goal of modern CRMs is to ensure that there are adequate amounts of investments that will enable the most cost-efficient and reliable operation of electricity systems with significantly increased shares of variable renewable energy (VRE). Thus modern CRMs cannot only focus on ensuring system adequacy, but also need to be designed to incentivize flexible assets that allow the temporary co-existence of VRE and conventional technologies. Modern CRMs must reward generation, demand-side resources and storage in an equal and fair way.

⁹ A full overview of CRMs and their design characteristics can be found in CAN’s working document – See reference in footnote 1

The regional perspective on energy market reform is also of high relevance. The challenge facing policy makers is no longer an individual Member States' challenge, especially as the European internal energy market becomes increasingly integrated. Since national CRMs are spreading across Europe, harmonizing asymmetric CRMs and ensuring they cover the market at the regional level becomes a priority. A spread of asymmetric and unilaterally introduced CRMs would lead to competition distortions, with investments shifting to markets with higher incentives, rather than to those with the most need. In this case, modern regional CRMs would help create a framework that facilitates the right investments towards a decarbonized and competitive Europe, maximizing existing assets and fully optimizing the spread of resources across larger zones.

Simplified Examples

Traditional CRM: *They are designed in a technology neutral way, they can reward new or existing generation plants. Only the power producers that are located in the country can apply for the remuneration. This will lead to incentives to existing coal-based power plants, who have already amortised their investment and can provide existing capacity at a very competitive price.*

Modern CRM: *They are not necessarily a technology neutral approach, addressing only technologies that are more complementary to variable renewables (e.g. gas-power plants). They do however need to treat demand-side participation, storage and generation plants in an equal way. If the demand-side measure or the storage capacity can react quickly to changes of generation patterns from VRE - which they normally do - then they will have a chance to get the capacity remuneration, and avoid providing financial support to fossil-fuel plants. Furthermore, the mechanism needs to compensate capacity assets located in any area that could satisfy the future capacity need. For instance, a UK CRMs should be able to compensate assets in Ireland if they can provide the same service as national ones. In that case, the physical inter-connector should also be eligible to receive remuneration, and thus avoid the construction of overcapacity in the UK.*

CRMs comparison	<i>Traditional approach</i>	<i>Modern approach</i>
Effects linked to incentives/capabilities		
Ensure peak demand is met	Yes	Yes
Cost-efficient in the long term (considering a significant increase in the share of VRE)	No	Yes
Improves the feasibility of demand side solutions and storage	No	Yes
Helps address the missing money problem	No	Yes
Effects linked to the geographical scope		
Lead to overcapacity	Yes	No
Distortion of cross-border trade in the IEM	Yes	No
Distortion of competition in the IEM	Yes	No
Works at cross-purposes with EU market integration and competition/state-aid policy	Yes	No

Table 1: Overview of differences between the traditional and the modern CRM approach

4. Conclusions

Firstly, capacity remuneration mechanisms (CRMs) are very complex, both in their design as well as in their system effects. Not only do policy makers have a huge amount of potential choices from which to choose when designing a capacity mechanism, the effects of their implementation are similarly far-reaching and difficult to quantify. Many complexities and details need to be fleshed out through further research. This needs to happen before taking any hasty decisions that result in EU regulatory lock-in, and policies that move Europe further away from the goal of a single energy market.

Secondly, Member States have so far introduced CRMs that are *traditional* in terms of both the geographical scope and the lack of incentivisation of capabilities. This is leading to a number of economic and environmental inefficiencies, as explained above.

It cannot yet be empirically proven that modern CRMs do in fact have the positive effects identified in our analysis. However, the presented arguments against the traditional approach, in combination with the observation that European Member States are in fact taking nationally focused approaches, leads us to conclude that Europe has a huge challenge ahead. Ignoring, or even denying the need for CRM implementation and modernization across Europe can be counterproductive to the realization of climate and energy policy goals. CRMs need to be well-designed from this moment onwards, otherwise Europe will not be investing in the *right assets* that are needed for a future energy system based on high shares of renewable energy, that is competitive and carbon free.



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Climate Action Network (CAN) Europe is Europe's largest coalition working on climate and energy issues. With over 120 member organisations in 27 European countries, CAN-Europe works to prevent dangerous climate change and promote sustainable energy and environment policy in Europe.