# ENERGY SYSTEM OF TOMORROW

***Reconsidering the European Electricity Market for a Flexible, Resilient, People-centred and Efficient System with 100% Renewables***

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# KEY MESSAGES

- We are going through a **fossil gas crisis** in the midst of a climate emergency. It is imperative that any intervention in the existing electricity market accelerates the **phase out of fossil fuels and other non-renewable sources**, while accelerating the roll-out of renewables, electrification, and demand-side flexibility (including storage and distributed energy resources);

- A Paris-Agreement-aligned emissions reduction pathway, with solid and **ambitious energy targets for 2030, 2040 and mid-decade benchmarks** to comply with the **Climate Law's** requirement to assess climate impacts, must guide all proposals to amend the internal electricity market design;

- Any reform of the electricity market should recognize **people's right to clean and affordable energy as well as the value of their participation in the energy system**, granting adequate access to capital, technology and knowledge by all, and ensuring a stable and trustworthy landscape for active consumers, minimising their exposure to risk and maximising the benefits of demand-side flexibility and distributed energy resources;

- **An impact assessment** on the implementation of the EU Electricity Market Design, as part of the Clean Energy Package, is required to assess the extent to which market design and the Clean Energy Package are delivering on their consumer-centric and decarbonisation-oriented objectives. Such an impact assessment must also inform **the revision of the EU Strategy on Energy System Integration** to have a market fit for 100% renewables by 2040 - "war-time" structural interventions in the scope of the reform must be carefully considered not to damage the core of it;

- **Demand-side measures** (including energy savings and flexibility - storage) must be valued as resources, **on equal footing with supply-side,** and incentivised to reduce the peak demand and replace the 'marginal' but very costly role of fossil gas while ensuring consumers are at the driving seat of their energy bills - fully benefiting from the compression effect of increased penetration of renewable energy sources on the electricity price;

# KEY RECOMMENDATIONS

- Transform the voluntary emergency measures to reduce gas demand by 15% (to be increased gradually to achieve 2035 gas phase out) into a structural measure, including **an obligation to reduce electricity demand by at least 5% during peak hours** through demand-side flexibility and energy savings;

- Ensure that the reform is **in line with the EU Digitalising the Energy Sector action plan** to elevate its impact: ACER and National Regulatory Authorities (NRAs) should have a stronger role in setting out smart grid indicators to TSOs and DSOs, and recommend data requirements to the Commission who would track how Member States implement the required increase in cost-efficient demand-side measures (for example starting from NECPs);

- Improve the economics of both implicit and explicit demand-side flexibility (including storage and distributed energy sources) through **value stacking**[1] in order to unlock more capacities of flexibility: proper remuneration by giving them **access to all markets and mechanisms, minimum bid size reduction to 100kW;**

- Rethink capacity remuneration mechanisms: create **a level playing field** for demand-side flexibility (reduced minimum bid sizes), lower the required CO2 threshold to **0g of CO2 per kW per hour (during operation)** of electricity for new assets, and introduce **a gradual decrease of yearly CO2 threshold**, in line with the 2030, 2040 and mid-decade emission reduction targets, to ensure renewable energy and demand-side resources push fossil fuels out;

- Unleash the benefits of local renewables by allowing **energy-sharing** behind the substation, and use this as a first step in the path to establishing local markets;

- Require **a wide portfolio of retail electricity contracts** available for consumers to choose from, according to their status and preferences, in order to effectively increase the exposure to time of use prices (as the digital enablers become widely available) while making them benefit from them;

1. Value stacking for demand-side flexibility means the possibility of bundling multiple value streams from different grid services, which can improve the economics for distributed energy resources. For example utility-run smart thermostats, which deliver both demand response and energy efficiency benefits, or value stacking by combining different distributed energy sources such as PV and storage. See: https://www.raponline.org/wp-content/uploads/2019/08/rap_shenot_linvill_dupuy_combinations_pv_other_ders_2019_august.pdf

# INTRODUCTION

Unprecedented levels of global energy price increase and volatility due to the EU's systemic dependence on fossil gas started surfacing by the end of 2021. In order to shield consumers (households, businesses and industry) and overall economies, European governments started implementing short-term energy market interventions. In the meantime a debate about the functioning of the European internal electricity market developed, with Member States and other stakeholders putting pressure on the European Commission to take action, which accelerated with Russia's invasion of Ukraine in February 2022.

The Commission's May 2022 REPowerEU Plan came out with additional communication pieces, including one on "Short-Term Energy Market Interventions and Long Term Improvements to the Electricity Market Design – a course for action", proposing some short-term EU-wide intervention measures while signalling potential structural changes in the electricity market design to make it better suited to "future price volatility and fit for the future decarbonised energy system, with an increasing share of renewables in electricity production". The European Commission, informed by a detailed analysis of the EU wholesale electricity market design by the Agency for the Cooperation of Energy Regulators (ACER), concluded that the wholesale market delivered efficiently as a well integrated market, allowed Europe to reap all the benefits[2] of a single energy market, ensuring security of supply and sustaining the decarbonisation process. The Commission also acknowledged that improvements will be needed "to ensure affordable energy for everyone all the time, protecting consumers against high and volatile energy prices, ensuring investments in supply solutions, and enhancing flexibility to reduce peak demand - thus, peak prices".

After a series[3] of emergency intervention measures proposed by the Commission through the ongoing gas crisis, a targeted reform of the electricity market design was announced to kick off early 2023 with a public consultation, but without an impact assessment of the implementation of the existing market design that was adopted in 2019 as part of the Clean Energy Package.

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2. In its analysis, ACER estimates that the benefits of the current structure and functioning of the EU wholesale market, enabling cross-border trade in an efficient automated system, is approximately 34 billion Euros a year while facilitating a significant uptake of renewable energy generation.
https://acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%27s%2520Final%2520Assessment%2520of%2520the%2520EU%2520Wholesale%2520Electricity%2520Market%2520Design.pdf

3. In October 2021, the Commission came out with a toolbox to tackle rising energy prices: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2021%3A660%3AFIN&qid=1634215984101 In October 2022, a regulation for an emergency intervention to address high energy prices was proposed: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R1854&qid=1666346543254&from=en It was adopted by the Council in record time: https://www.consilium.europa.eu/en/press/press-releases/2022/10/06/council-formally-adopts-emergency-measures-to-reduce-energy-prices/ Finally in December 2023, a Council regulation for a market correction mechanism was proposed: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0668&qid=1669911853248 It was adopted by the Council in record time: https://www.consilium.europa.eu/en/press/press-releases/2022/12/19/council-agrees-on-temporary-mechanism-to-limit-excessive-gas-prices/#:~:text=The%20regulation%20aims%20to%20limit,citizens%20from%20skyrocketing%20energy%20prices.

Considering structural changes in the relatively recently adopted, and barely implemented, electricity market design during “war time” is very risky. The Commission must be extremely clear to orient the reform around strengthening the market design to work for the consumers, unleashing the people-power for a renewables-based system, especially because the reform will likely be transposed in two years time the earliest and probably in a different context. Any impulsive reaction to the current war context, due to massive pressure by Member States trying to run their costly fossil fuel or nuclear energy infrastructure for longer due to energy security concerns, carry huge risks for achieving an energy system which puts people in the center, accommodates and accelerates the intake of 100% renewables, and helps deliver the EU’s Paris-agreement commitments.

Although the Commission has been explicit about bringing a targeted reform, without an intention to amend the core of the internal market functioning and price setting, the design of the internal electricity market is so complex that any changes to certain elements of the market may have implicit implications for other elements. Therefore, we strongly recommend that the Commission frames targeted amendments as part of an accelerated plan to achieve a consumer-centric, decentralised, strong and flexible electricity market to fully run on variable renewables, valuing demand-side measures as proper resources balancing the supply-side in harmony.

Reforming the electricity market design is not a silver bullet. The EU’s commitment to deliver its fair share under the Paris Agreement, as well as the urgent need for secure, reliable and affordable energy means that there is an urgent need to transform the European energy system. And reforming the market design alone, will not make the needed transformation happen. Focusing limited time and resources on amending the existing market design also draws attention and efforts away from properly implementing those provisions of the Clean Energy Package which could have done much to alleviate the negative impacts of the current fossil gas and cost of living crisis (e.g. empowering energy communities and unleashing the full potential of demand-side flexibility).

Beyond the changes in the market design, deploying ambitious energy saving measures, scaling and speeding up renewables in a nature-positive manner, expanding transmission/distribution grids and using the existing grid infrastructure more efficiently, shifting taxes away from electrification to gas and from households to polluters, phasing out fossil fuel subsidies as well as implementing the existing electricity market design to empower individual/collective self-consumers and energy communities are mandatory pieces of the puzzle.

Ensuring a strong long-term electricity market for renewable energy sources is crucial as the current gas crisis and COVID crisis showed the clear weaknesses of relying mostly on the short-term market's price signals: by putting households and enterprises under pressure because of high gas prices, and because of the extreme compression of the wholesale prices (that weren’t mostly passed on to retail users), and which would, if sustained, have put new renewables investments in doubt during the COVID crisis.

However, short-term markets are fundamental to give the right signals to incentivise demand-side measures (including energy savings, demand-side flexibility and self-consumption). Therefore, CAN Europe does not support any proposal that would put clear price signals to activate flexibility at risk.

The Energy Efficiency First (EE1st) principle must guide the reform process with a systems approach as explained in the Commission's 2021 recommendations and guidelines.[4] As an overarching principle, it should help systemically bring supply and demand-side resources (energy savings and demand-side flexibility) on an equal footing: need to aim not only at technology neutrality but at technology inclusivity, both need to be treated as power system resources to receive the value they bring to the system in an equal way.[5]

This briefing lays out CAN Europe's vision and preliminary proposals for the reform of the internal electricity market design (EMD) on the table. It analyses the Commission's consultation paper and questions, through the lens of CAN Europe's three main objectives: **A Paris-agreement-compatible energy transition to achieve 100% renewables, coupled with maximum energy savings, by 2040; strong, resilient and flexible markets; affordable energy for all and just transformation.** It proposes measures for the short-term, long-term/ forward and retail markets in the scope of the EMD reform.

Due to the characteristics of the Commission's consultation and the-three-week timeline to respond to detailed questions - in many cases without an option to explain short answers, as well as having to respond to a consultation without a detailed impact assessment, constraints this paper to be a detailed feedback to the consultation.

4. Energy Efficiency First principle is defined in the Art (2)18 of the Governance Regulation (Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action). However, as this definition is vague, the Commission issues detailed recommendations and guidelines "from principles to practice" in 2021 to guide its implementation. The recommendation clearly says: "The EE1st should look at efficiency improvements at the system level. It means that energy system optimisation and efficient integration of clean energy solutions are at the centre of the principle's application. This requires a wider view where supply-side resources (fossil fuels, renewables, infrastructure) are assessed against demand-side resources (demand flexibility and demand response, improved energy performance of specific solutions, energy sufficiency) looking at costs and benefits from a societal perspective"

5. Zsuzsanna Pató, Regulatory Assistance Project, "Options for the Better Integration of Demand-Side Resources" (commissioned by European Commission Directorate Energy) November, 2022.

# SUMMARY TABLE: CAN EUROPE'S FEEDBACK ON ELECTRICITY MARKET DESIGN REFORM OPTIONS

| CAN Europe objectives | Short term markets | Long-term markets | Retail markets |
|---|---|---|---|
| **Paris- Agreement-compatible energy transition** | Impact assessment on EMD demand-side flexibility (DSF) provisions' implementation<br><br>**Align with digitalisation action plan: ACER and NRAs to have a stronger role in setting out smart grid indicators to TSOs and DSOs**<br><br>Adopt Energy Efficiency First as a horizontal guiding principle to value demand-side measures on equal footing with the supply-side | **Climate-law proofing: Embed Paris-aligned emissions' reduction trajectories for 2030 and 2040, and fossil fuel phase out targets**<br><br>Provide a level playing field for and recognise the value of DSF and smaller actors in all long-term contracts<br><br>**Rethink CRM: lower required CO2 threshold to 0g of CO2 per kWh of electricity for new assets, introduce a gradual decrease of yearly CO2 threshold**<br><br>No new long-term remuneration mechanism for fossil fuels and nuclear, to avoid lock-in | **Targeted support for the vulnerable, low-income, middle-income to accelerate energy savings and electrification to substantially reduce consumer bills, complementing the design of charges and tariffs favouring electric appliances, vehicles and heat pumps**<br><br>Ensure that Member States establish social protection measures for vulnerable consumers at all times, and provide targeted support only for those consumers during crisis situations |
| **Affordable energy for all/Just Transformation** | **Incentivise consumer efforts to save energy and become active in the market by enabling the roll-out of smart-meters and sub-meters, facilitating simplified remuneration mechanisms adapted to different user profiles**<br><br>Align with the digitalisation agenda: increase digital literacy, cross-reference with social policy to leave no one behind - in line with the European Pillar of Social Rights | Remove the barriers for energy communities to hedge so that more people can benefit from the energy community setting<br><br>**Distributed energy producers should be allowed to play a role in all long term contracts**<br><br>The price setting mechanism of long-term contracts should be technology-inclusive and recognise the cost and the added value of bidders for the whole system and society, going beyond pure price compression | Define different consumer profiles to incentivise those ready to be flexible self-consumers and shield the vulnerable while incentivising their participation in energy community/energy sharing and other such schemes<br><br>**Gradual shift to dynamic tariffs for consumers to be exposed to hourly fluctuations to benefit from low-cost RES while always giving the choice to have different types of contracts, with clear explanations of risks and benefits of all** |
| **Strong, resilient, flexible markets** | **Enable energy sharing behind sub-station: clarify definition of energy sharing and remuneration**<br><br>Value stacking for DSF and energy efficiency: proper remuneration of prosumers based on locational price signals<br><br>**Reduce minimum bidding size to 100 kw in order to allow a level playing field for demand-side flexibility and smaller renewables actors**<br><br>Transform 15% gas demand and 5% electricity peak demand reductions emergency measures into a structural measure (with a timeline to achieve 2030 coal and 2035 gas phase out) | **Guide towards an agreed design of long-term contracts, which would make sure not to numb short-term signals, and provide level playing field**<br><br>Rethink European Resource Adequacy Assessments (ERAA) to assess system flexibility beyond adequacy of conventional supply resources to enable DSF in CRM | **Ensure those involved in energy sharing keep paying their fair share of costs (not creating new equities), and are fairly rewarded for the contributions they make to the system in terms of real value**<br><br>Incentivise enablers to activate consumers, including sub-meters, to reap the opportunities in shifting to dynamic tariffs - specific support must be prioritised for low-income and vulnerable households as people who need to use DSF to lower bills and to avoid widening inequities |

# PARIS-AGREEMENT COMPATIBLE ENERGY TRANSITION

In order to deliver the Paris Agreement, the EU needs to put an end to dangerous, polluting, and expensive fossil fuels. This means phasing out coal by 2030, gas by 2035 and oil by 2040 at the latest. Additionally, tomorrow's energy system empowering people and citizens means the majority of other dangerous, expensive and unreliable energy sources, such as nuclear power plants, would be closed by 2040 and no later than 2050.

The ongoing gas and energy price crisis clearly shows that no fossil-fuel can be promoted as a "transition fuel". The alarm bells are clearly calling to take solid action to phase out fossil fuels[6] as soon as possible - this time around, with the urge to achieve security of supply, and to protect people, businesses and entire European economies. CAN Europe had warned the European Commission about the need to adopt the Energy Efficiency First (EE1st) Principle as an overarching guiding principle, as well as the need to stop projecting fossil gas as a transition fuel in the scope of the State aid CEEAG Guidelines, which were adopted only two months before Russia's military attack on Ukraine started. Unfortunately, despite positive elements to align competition policy with the Green Deal, the revised guidelines failed to both define fossil-gas-lock-in, and embed EE1st principle to systematically guide aid decisions, while introducing provisions for targeted support to coal-to-gas in certain Member States.

**Any reform of the electricity market design must assess all existing and proposed provisions through the filter of a Paris-Agreement-aligned emissions reduction pathway**, avoiding lock-in to conventional fuels, guided by solid and ambitious targets for 2030[7], and intermediate targets[8] between 2030 and 2050.

The EU Climate Law established a European Scientific Advisory Board on Climate Change (ESABCC) to underpin the EU's trajectory towards climate neutrality, with independent scientific expertise and the best available, up-to-date and transparent evidence on possible pathways, targets, greenhouse gas budgets and policy measures to ensure coherence with the Climate Law and the EU's international commitments[9] under the Paris Agreement. The Commission's proposal on a 2040 climate target is expected in May 2024 at the latest, and the ESABCC is planning to publish a quantitative assessment by April 2023, to inform the Commission's 2040 target setting process. The Board has already published a qualitative input to inform the Commission on the principles that should be followed when setting up the 2040 target. Equity and solidarity are some of these principles, which should also be taken into account for any reform of the electricity market design.

6. Nuclear energy cannot be promoted as a solution for "energy security" either as it is a false solution to the climate crisis. Russia's invasion of Ukraine demonstrated how vulnerable nuclear energy is in conflict situations; it has unresolved issues of its radioactive wastes; and new nuclear power plants are way too expensive.
7. Climate targets agreed under FitFor55 and based on the highest possible energy targets in the scope of RED and EED, currently in trialogue negotiations: https://higherambitionnow.eu/
8. A process for setting a 2040 climate target, taking into account an indicative greenhouse gas budget for 2030-2050 to be published by the Commission, was agreed under the Climate Law: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_1828
9. Including the harmonisation of the Union's targets with the 5-year-cycle of Nationally Determined Contributions (NDC) revisions

Electricity market design Directive and Regulation, adopted in June 2019 as part of the Clean Energy Package, neither refers to 2030 emission reduction targets nor the intermediate target setting process, as they were adopted under the Climate Law two years after the Clean Energy Package.

The Commission's EMD consultation paper only refers to 2050 climate neutrality objectives, and does not even mention the 2030 emission reduction target. This is surprising, considering all the effort made to secure a solid FitFor55 package, and a European Climate Law (2021) which requires (Art. 4(1)) the Commission to 'prioritise swift and predictable emissions reductions' to meet specifically the 2030 target. That prioritisation must be at the core of the market design reform. The Commission's own FitFor55 impact assessment (2020) acknowledges that "increasing electricity demand (through electrification of transport and heating) will be met with more efficient capacities being commissioned (in particular wind and solar) while less efficient ones (fossil fuels) will decrease over time". Moreover, under its REPowerEU proposals, the Commission's analysis shows that renewables would reach a 69% share of Europe's power market by 2030, which should put the EU on track to fully decarbonise its electricity system by 2035.

Given the important role of increased electrification, renewable energy and flexibility in demand sectors as agreed by all credible decarbonisation scenarios,[10] the **EMD reform proposal must be guided by targets for 2030, 2035 and 2040**, to keep the EU on the right climate path. The reform proposal should also put in place reporting requirements for monitoring the impact of proposed changes on the EU's energy trajectory. This is particularly important for new wind and solar capacities. Data should be publicly available and updated on a monthly basis, split by scheme i.e. PPA, CfD, subsidy scheme or none.

Security of supply concerns are real and understandable, and primarily driven by the EU's dependence on fossil gas - notably imported gas from Russia in the current context. However, **in tomorrow's energy system fed by variable and significantly decentralised renewables supply, security has a more holistic meaning: searching for the optimal balance between the interaction of demand and supply**. In this sense, energy system security also means resilience which is extremely hard to achieve in a "base-load" system that is systemically dependent on centralised, non-renewable energy sources where consumers are simply perceived as passive receivers of market outcomes. In fact, the major weakness of the current system is mostly counting on costly fossil gas (and other expensive energy sources, such as coal and nuclear) as if they are "saviours" to balance the market when renewables are not able to fulfil the demand - especially at peak times. It frames non-renewable fuels as being indispensable for the system, which is the complete opposite of resilience as we have been experiencing. The only way to change this, is to shift the mentality towards valuing demand-side flexibility, individual and collective self-consumption, and energy savings as resources to urgently replace the marginal but very costly role of

10. See CAN Europe PAC Scenario: https://caneurope.org/content/uploads/2020/06/PAC_scenario_technical_summary_29jun20.pdf
See IEA Net Zero 2050: https://iea.blob.core.windows.net/assets/7ebafc81-74ed-412b-9c60-5cc32c8396e4/NetZeroby2050-ARoadmapfortheGlobalEnergySector-SummaryforPolicyMakers_CORR.pdf

fossil gas and other non-renewable energy sources while making market actors out of activated consumers. The role of so-called “peaker plants” must be planned now to significantly diminish in the course of the next decade, to be replaced by other flexibility options. Existing support for peaking power plants, as well as nuclear power plants that block deeper penetration of renewables and flexibility, must be shifted towards flexibility options.

A 100% renewable energy system, dominated by solar and wind is safe and stable when it is complemented by a **broad range of flexibility options**: expanded grids, flexible and sustainable renewable energy supply, demand-side measures (including energy savings and self-consumption), increased interconnection and different storage technologies (such as hydrogen from electrolysis, batteries, pumped hydro and thermal storage). **The era of baseload is over**. Big fossil-fuel-fired power plants and nuclear reactors rather cause grid congestion than securing a back-up for renewables.

Fossil gas turbines and cogeneration can be one of the flexibility options until the **Paris-agreement-aligned gas phase out by 2035**, under the condition that alternative flexibility options have to apply first, new gas capacities are not eligible for public subsidies, and subsidies for existing gas plants do not cause a delay in the gas phase-out.

The EMD reform is proposed in the middle of a historic moment as the humanitarian, social and climate emergencies as well as a generally agreed sense of a paradigm shift on the scale and speed of needed energy transition unravel. It must propose measures to be on the Paris-pathway to phase out conventional fuels and achieve a strong, flexible, resilient and consumer-centric system to run on variable renewables. These measures include:

- Adopt Energy Efficiency First principle as a horizontal guiding principle with a systems approach to value demand-side measures as resources on equal footing with the supply-side;[11]

- Assess all existing and proposed provisions through the EU 2030 emission reduction targets, and intermediate targets for 2035 and 2040, filter in order to reform them coherently;

- Set **a fossil gas phase out deadline, by 2035** as compatible with the Paris Agreement objectives, to avoid lock-in due to contractual commitments made for existing gas plants to operate for decades;

- Align with digitalisation action plan: ACER and NRAs to have a stronger role in setting out smart grid indicators to TSOs and DSOs, recommend data requirements to the Commission - track how Member States implement the required increase in cost-efficient demand-side measures (for example starting from NECPs)

11.Zsuzsanna Pató, Regulatory Assistance Project, “Options for the Better Integration of Demand-Side Resources” (commissioned by the European Commission Directorate Energy) November, 2022.

- Rethink capacity remuneration mechanisms (CRM): lower the required CO2 threshold to 0g of CO2 per kW per hour (during operation) of electricity for new assets, and introduce a gradual decrease of yearly CO2 threshold, in line with the 2030, 2040 and mid-decade emission reduction targets, to ensure renewable energy and demand-side resources push fossil fuels out and have a chance to benefit from CRM;

- No new long-term remuneration mechanism should be available for **fossil fuels and nuclear**, as this would create a lock-in;

- Introduce strong price signals related to environmental impact, social impact, locational and time of activation services in both short-term and long-term remuneration mechanisms, in order to **align pricing with costs and value** of the role of different supply and demand-side technologies;

- Ensure **targeted support** for the vulnerable, low-income, middle-income households **to accelerate energy savings** and electrification to substantially reduce consumer bills, complementing the design of charges and tariffs favouring electric appliances, vehicles and heat pumps, and incentivise becoming flexible self-consumers.

## STRONG, RESILIENT, FLEXIBLE MARKETS

Acknowledging the strength of the short-term electricity market, in its consultation the Commission looks into instruments to be integrated in the EMD to complement the short-term markets. This would incentivise the use of long-term contracts (mainly Contracts for Differences - CfD and Power Purchase Agreements - PPA) to shield energy bills and inframarginal revenues against fossil-gas driven price volatility.

It is true, and there is a broad consensus by now, that there is a need to strengthen long-term markets. Currently there are different uses of long-term contracts in different countries, mostly without a central regulatory mechanism. Historically CfDs and PPAs have been more accessible to utility-scale renewable energy producers - signed with the state for CfDs, and with the industry for PPAs. The question to tackle is how to shape them so they are accessible to both smaller and bigger RES actors, and beneficial for consumers, producers and the overall energy system. For a Paris-agreement-compatible energy transition, the scale of renewables deployment is so massive that **we need to maximise the installation of both utility-scale and distributed renewable energy sources**, and the uptake of electricity produced by them. Obliging long-term contracts could automatically mean pushing smaller actors, such as energy communities and self-consumers, out as they usually lack the means and capacity to actively participate. This means supportive measures are needed to incentivise both centralised and decentralised renewable energy investments and production with tailored remuneration mechanisms adapted to different profiles, while ensuring short-term price signals from variable renewables are effective to ensure that flexibility helps the uptake of renewables and pass the benefits of their low-costs on to people's bills.

According to recent research, prosumers can provide up to 70% of the total electricity in the EU in 2050, solar and wind being the technologies with the highest potential. In order to achieve Paris-aligned targets as well as affordable and secure energy, the EU needs to be on the path to 100% renewable energy by 2040, which means deliberate mechanisms are needed to unlock all the potential of renewables both in the demand and supply sides.

ENTSO-E defines Europe's future energy landscape as a System of Interdependent Systems: "a secure transition towards carbon neutrality needs the deployment of both short and long duration flexibility resources to be coordinated with the integration of weather-dependent renewable generation sources and the phase-out of fossil-fuel generation. These resources will be located at transmission and distribution, onshore and offshore, and in other energy sectors".

Any intervention in the market functioning must be carefully designed to be on track to achieve the System of Interdependent Systems. Regulating long-term contracts needs a lot of attention not to cause a lock-in to a centralised energy system, with doors open for non-renewable sources, by blocking short-term market's price signals that enable demand-side flexibility needed to balance increased intake of variable renewables. Short-term price signals being muted cannot activate demand-response (in terms of energy savings and demand-side-flexibility), to help shave the peak. This would risk further dependence on expensive fossil fuels to balance the system as they would be needed to supply when the demand peaks, and if they have long-term contracts, a gas lock-in becomes a high risk - without a phase-out date, which we cannot afford. Moreover, it would block economic savings (upto €2.7 bn annually, according to recent studies) in avoided peak generation capacity.

In order to mitigate such risks, other actions in the EMD, and beyond, would be needed to:

- Transform **15% gas demand and 5% electricity peak demand reductions**, currently in force as emergency measures, into structural measures (with a timeline for gradual increase in reductions to achieve 2030 coal and 2035 gas phase out);

- Provide a **level playing field** and give flexible self-consumers, storage, energy efficiency and other demand-side measures, independent RES producers and energy communities access to all long-term contracts, for example by **reducing the bidding size to 100kw**, offering less complex schemes for smaller actors, and giving a stronger role to aggregators;

- Rethink European Resource Adequacy Assessments **(ERAA): enlarge the scope**[12] **to assess system flexibility** beyond adequacy of conventional supply resources to ensure demand-side flexibility (including distributed energy sources) can be remunerated by CRM;

12. The ERAA for 2021 submitted by ENTSO-E was not approved by ACER with the main argument that it did not properly assess and value flexibility options: https://mondovisione.com/media-and-resources/news/acer-decides-not-to-approve-entso-es-first-pan-european-resource-adequacy-asses/ In its Vision: A Power System for a Carbon Neutral Europe (October 2022), ENTSO-E also suggests that in the future it should become possible to define resource adequacy levels in a more sophisticated and customised manner for more flexible consumers capable and willing to reduce their consumption during scarcity situations: https://vision.entsoe.eu/

- Require **national demand-side flexibility targets**, informed by an **impact assessment** of the implementation of the EMD demand-side flexibility provisions under Clean Energy Package, as part of **NECPs**, to incentivise Member States' approach to long-term markets and be in tandem with the process to activate ACER's framework guideline on DSF;

- Guide towards **an agreed design of long-term contracts**, which would make sure not to numb short-term signals, and provide level playing field for smaller and decentralised renewables actors

- Retailers must be able to benefit from renewable PPAs for hedging, and as the digital enablers become widely available and accessible, they should be required to **offer a wide portfolio of contracts for consumers** to be able to choose according to their status and preferences, including pricing schemes such as real-time time of use, critical peak pricing time of use, in order to reap more benefits of low-cost variable renewables while playing a role to optimise the energy system for RES uptake;

- Revise the EU Strategy for Energy System Integration, which was developed in the COVID recovery context, to adapt it to the REPowerEU context and enable the EU Solar Energy Strategy, with **ambitious time-bound targets** to roll out required automation, digitalisation and the installation of smart meters and sub-meters - guaranteeing full access to data by own users;

- Enable **energy sharing behind the substation**: clarify the definition of energy sharing as an activity, make sure energy sharing is rewarded for the contributions it makes to the system in terms of real value, and give DSOs a "duty to cooperate" with energy communities to facilitate energy sharing.

## AFFORDABLE ENERGY FOR ALL: JUST TRANSFORMATION

The reform of EMD is a good opportunity to give **a clear signal to investors and Member States**, who are currently programming the REPowerEU chapters of their Recovery and Resilience Funds, about the EU's move away from a traditional energy system (a thing of the past) running on supply-driven base load, with consumers as passive receivers, to a decentralised, digitalised, fair system where people are active actors deciding on when and how much energy to consume, store, produce and sell.

CAN Europe's Just Transformation vision acknowledges that "a societal transformation to a climate-safe world is only possible if we recognise the irrevocable links between social and environmental goals and the need for a new governance structure: social goals cannot be achieved at the expense of environmental sustainability".

As the ongoing fossil gas crisis demonstrates, a conventional-fuel-dependent energy system, giving consumers very little space to change the consequences helps neither social and economic goals, nor environmental goals. A just and fair energy transition can help deliver both the Paris agreement and the European Pillar of Social Rights. Transposition and implementation of the existing EMD, as well as a targeted reform of it can accelerate this.

The electricity market must **support and value local ownership of renewable energy production and supply**. This is a principle the market should acknowledge, and it should help frame everything from incentives to reducing regulations and administrative barriers to setting up energy sharing and allowing communities to supply themselves with their own renewables production. Barriers in front of energy communities and prosumers (individual and collective) should be removed as there are many social, economic, environmental and overall energy system balancing benefits they bring.

For the EMD reform to contribute in the Just Transformation, certain measures must be adopted to:

- Ensure CfDs or other long-term contracts **do not limit energy communities' ability to provide socio-economic benefits** to their members as they do not seek profitability when supplying renewable energy, and provide other services that benefit the members and the local community;

- Ensure that Member States establish social protection measures for **vulnerable and low-income consumers** at all times, and provide **targeted support only** for those consumers (considering social tariffs or other exceptional interventions in price setting as well as rebates) during crisis situations, taking into account the gender dimension of energy poverty, but **avoid such regulatory interventions becoming a structural measure** in order to keep short term price signals to increase savings and incentivise all consumers to become active;

- Targeted direct income support measures need to go with **support measures to shift away from fossil fuel sources** in the mid to long term;

- Align with digitalisation agenda as accelerated electrification and automation is indispensable to become active consumers, incentivise an **increase in digital literacy** to leave none behind and deliver relevant objectives of the European Pillar of Social Rights;

- **Establish different consumer profiles** in terms of households, industry, commercials but also for households: incentivise those ready to be flexible self-consumers and shield the low-income /vulnerable while incentivising their participation in energy community/energy sharing and other such schemes;

- Enable prosumers to participate in the market through implicit[13] and explicit[14] demand-side flexibility schemes. Automation should ease their interaction with the system to facilitate the activation of their flexibility. For this to happen, **smart meters must be installed rapidly**, and the supplier or aggregator shall be responsible for defining the prosumer's contribution. Disaggregated demand data, obtained through smart meters and metering, should be used by aggregators and system operators to prove the impact of demand side measures;

- Build consumer trust by **moving towards interoperability**[15]. Consumer empowerment should effectively put the consumer first. Such a user-centric approach means moving away from proprietary solutions and towards interoperability of e.g. the protocols managing smart loads and energy management systems. In a maturing market, companies need to move to a common standard as soon as possible and fully support regulatory and standardisation efforts to deliver interoperability to avoid consumers' lock-in to groups of brands, which may hamper them to switch system/car brand in the future and clearly undermine trust needed to deliver household flexibility.

13. Implicitly in the wholesale market: by adapting consumption according to real-time price signals i.e. reducing consumption during peak hours
14. Explicitly in intraday and balancing markets: the idea is to be paid for the flexibility the prosumer provides, where prosumer via aggregator or other third parties pledges to sell a certain amount of electricity when needed and when the TSO asks them to activate, they do
15. Interoperability is the ability of two or more devices from the same vendor, or different vendors, to exchange information and to use that information for correct co-operation. See: https://fsr.eui.eu/interoperability-of-energy-services-in-europe-whats-behind-it/ and https://ecostandard.org/news_events/recommendations-for-smart-metering-system-rollout/