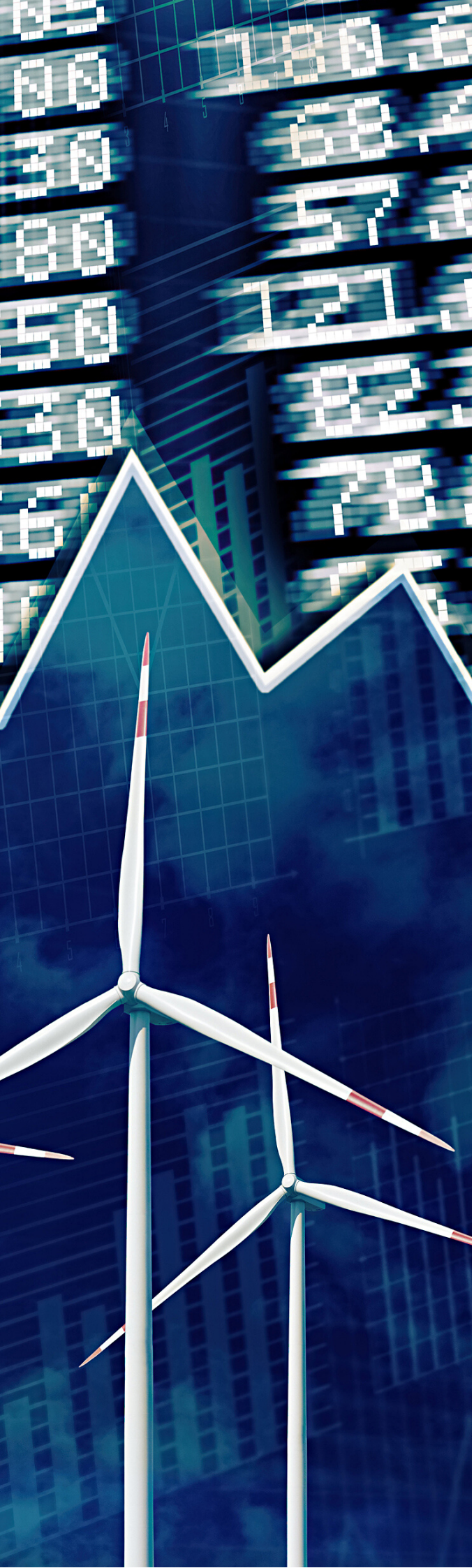

cerre Centre on Regulation in Europe
Improving network and digital industries regulation

RECOMMENDATIONS FOR A FUTURE-PROOF ELECTRICITY MARKET DESIGN

POLICY RECOMMENDATIONS

DECEMBER 2022

As provided for in CERRE's bylaws and procedural rules from its "Transparency & Independence Policy", all CERRE research projects and reports are completed in accordance with the strictest academic independence.

The report within the framework of which these recommendations have been prepared was authored by CERRE academic co-directors Michael Pollitt (University of Cambridge) and Nils-Henrik von der Fehr (University of Oslo), CERRE research fellows Bert Willems (Tilburg University), Catherine Banet (University of Oslo) and Chloé Le Coq (University Paris-Panthéon-Assas, Stockholm School of Economics), and contributors Anna Rita Bennato (Loughborough University) and Daniel Navia (World Bank, University of Cambridge). The project was coordinated by Albéric Mongrenier, CERRE Director for Energy, Mobility and Sustainability.

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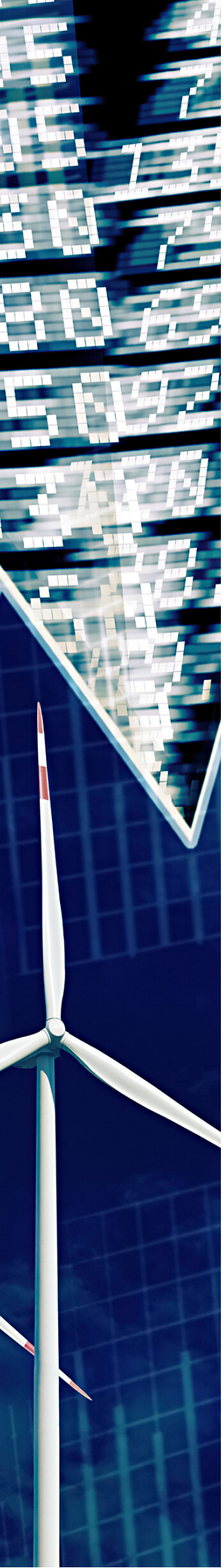

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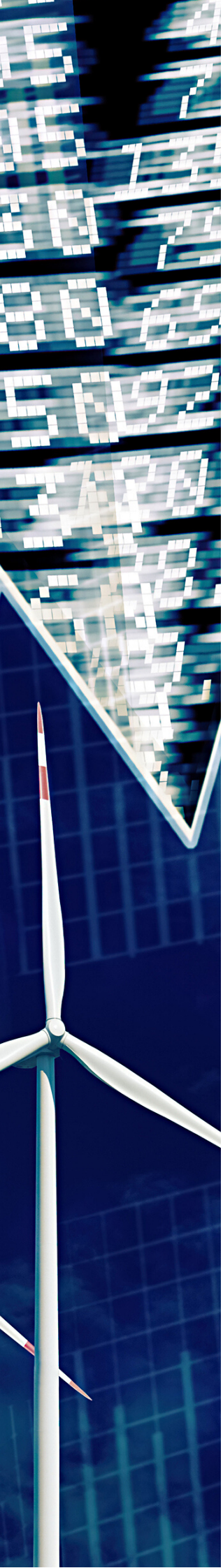


INTRODUCTION

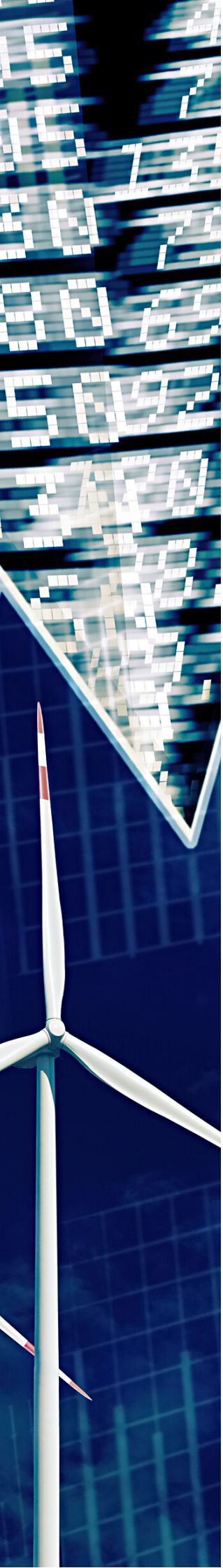
Winter has started, and EU governments and policymakers are still debating how best to contain the dramatic impact of high energy prices on households, industry and the whole economy. In parallel, the European Commission has indicated its intention to formulate proposals for longer-term adjustments to Europe's current electricity market design in light of the continent's net-zero objectives.

Against this background, CERRE's team of energy experts has, throughout 2022, been analysing the impact of the energy crisis and climate goals on Europe's wholesale and retail electricity markets.

This work is now culminating with the publication of an original, in-depth study titled "Recommendations for a Future-Proof Electricity Market Design". This report lists more than 70 policy recommendations to shape a market design that is resilient to shocks and supports the accelerated rollout of renewables over the next three decades.

The below list comprises both short- and long-term recommendations for wholesale and retail markets regulation. Some are at European level, some are for individual countries to pursue. A more detailed list and analysis can be found in the full recommendations report.

We thank CERRE's members and the many stakeholders we interacted with throughout the different stages of this project for their support and input. We hope these recommendations can contribute to the shaping of both crisis response efforts and long-term changes required on the way to a net-zero energy system.



CORE RECOMMENDATIONS

EU COMMON ENERGY POLICY AND COORDINATION BETWEEN MEMBER STATES

1. The **single energy market** has so far exhibited **resilience**. **Actions which weaken** it in the short- or long-term are to be rejected as they will only increase short-term threats on national energy systems and increase costs for customers.

2. Distinguish between **short-term crisis management** and **long-term market reform**, recognising that wartime short-term interventions should be proportionate, short-term and reversible.

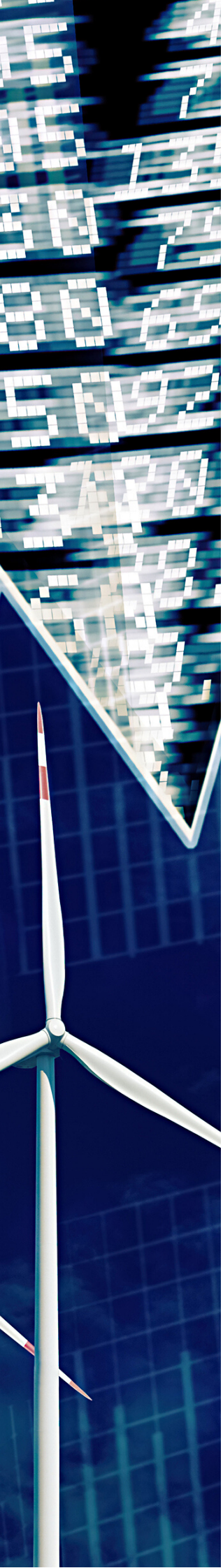
3. This is a **gas supply crisis**, and short-term national and EU-wide interventions towards wholesale and retail electricity markets must be evaluated as to their impact on aggregate European gas demand.

4. Low short-run demand elasticities for both gas and electricity mean that even **small reductions in aggregate gas demand** have a disproportionate effect on both gas and electricity prices. Country level policies which increase electricity (and gas) demand cannot be left unanswered at the European level.

5.The **Iberian cap** has raised Spanish and European gas demand and significantly distorted electricity trade with France (and Morocco). The measure is not proportional and should have been prohibited. **Alternatives exist** to support consumers with smaller effects on the internal market.

6. **Increasing aggregate supply** is important as even a small increase will have a disproportionate price effect due to the low short-run elasticities of electricity demand. **Regulatory barriers** (e.g., restrictions on permitting) to additional low carbon generation and distortionary taxes on marginal electricity production should be **removed**.

7. **A common approach** to common challenges through EU harmonisation measures must be in general prioritised to **avoid possible distortions** to the internal energy market and preserve its benefits for all states and market participants.



CORE RECOMMENDATIONS

CURRENT MARKET DESIGN, INCENTIVES AND EFFICIENCY

8. In a net-zero world, single market integration will become even more important in reaching our climate and security of supply goals at least cost. The **completion of the internal energy market** and the **implementation of the existing legislation** should remain a top priority.

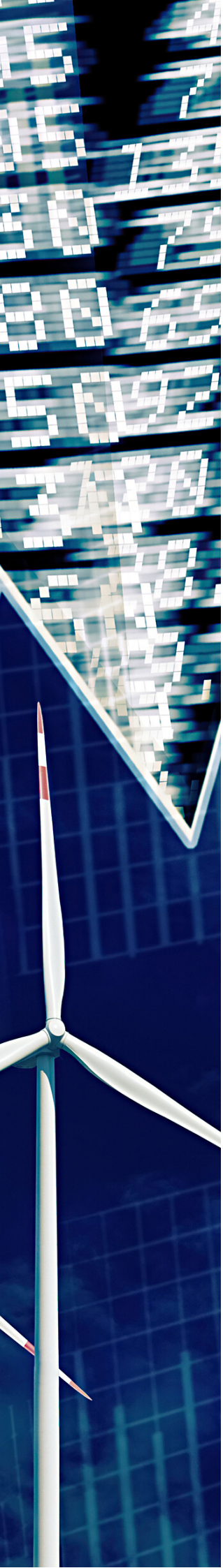
9. The conclusion of long-term physical contracts should not undermine liquidity on the power exchanges. Hence we should clearly **distinguish physical and financial hedging**. Financial contracts might allow for the better pricing of risk. Physical assets with high levels of availability might have to play a more important role as collateral and thus a physical hedge in margin call requirements.

10. Private financial hedging of electricity prices is a good idea before prices rise. In current circumstances, **government subsidies** (combined with future taxes) to electricity bills are likely to have **lower net present value (NPV)** cost than negotiating private generation contracts with existing generators to smooth consumer electricity bills.

11. Over the longer run, there are good arguments for signing **long-term price hedging contracts with new generators**, to provide price stability and certainty to electricity consumers and to lower the cost of capital faced by investors in generation.

12. Some of the recent suggestions for electricity market reform are sensible but they will not address the magnitude of the energy crisis in the time frame required. Such changes have to be looked at in the **context of the road to 2030 and 2050 climate goals**.

13. When considering emergency measures grounded in **Article 122 TFEU**, the European Commission and Member States should refrain from adopting measures that could have long-term impacts on the energy markets and from adopting more permanent mechanisms outside of the ordinary legislative procedure.



CORE RECOMMENDATIONS

FUTURE CHALLENGES

14. Better coordination of overall European electricity supply security can be achieved through **tighter EU monitoring** of the already existing processes for the elaboration of the **National Energy and Climate Plans (NECPs)**.

15. Protecting European industry from high marginal energy prices, in the long run, is not going to be possible, but, attention should be given to taxes and the **carbon border adjustment mechanism (CBAM)**, to reduce unnecessary distortions, protect European industry from unfair competition, and relieve the pressure to introduce industrial subsidies.

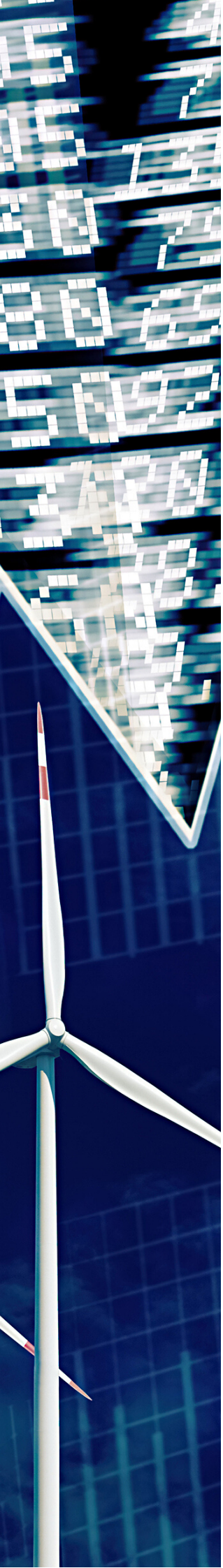
16. Allowing for even more flexibility in the adoption of **national state aid measures** will contribute to further supporting European industries in global markets, but it should not result in a **subsidy race** and weaker assessment processes at the European Commission level.

17. The timetable for the energy transition is already very challenging and the move towards greater electrification and the level of investment in **renewables, nuclear, storage, network and interconnections** should be accelerated.

18. **Permitting** of both RES and associated network capacity remains an issue in many countries and should be prioritised. Ramping up procedures for permitting new general capacity under emergency measures must be accompanied by a **coordination of grid development** and consumption scenarios.

19. The Commission could make some concrete proposals to rapidly **increase new agents' contribution** to addressing the current crisis, such as supporting the role of energy communities in the rapid deployment of **decentralised renewable energy generation**.

20. **Sector coupling** will be a reality by 2050, between power, heating and transport. Attempts to separate the price of energy between these three sectors should not be done at the wholesale level and will be increasingly difficult at retail level.



WHOLESALE MARKET RECOMMENDATIONS

KEEP MARKET DESIGN ISSUES IN PERSPECTIVE

21. As stated above, distinguish between what should be a future-proof market design under net zero objectives and medium- to long-term constraints, and temporary measures to address short-term disruptions. Likewise, it is important to distinguish between **pure market design** elements and **complementary mechanisms** aimed to address remaining market failures.

22. The impact of good short-term market re-design on market outcomes is small and the day-ahead auction rules do not matter much. Market outcomes are determined mainly by market fundamentals and structure. **Monitoring demand, supply and anti-competitive behaviour** are more important than changes to electricity market design.

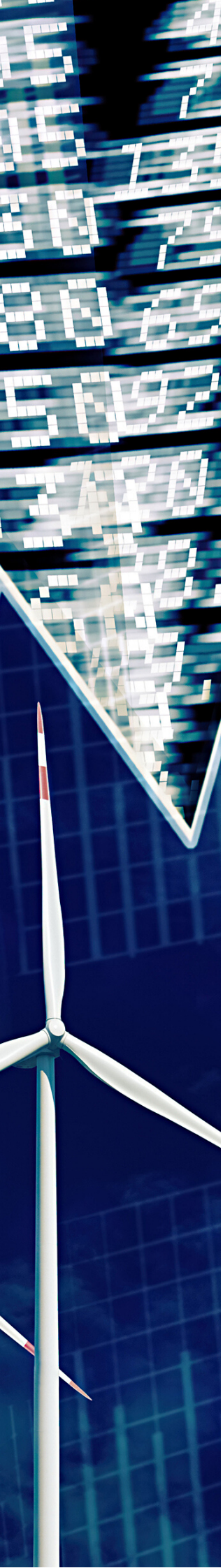
23. Moving to a **pay-as-bid auction** from pay-as-clear reduces economic efficiency, without much impact on average price paid, and is not recommended.

24. Now is not the right time to move to **US market design**. Its net benefits in delivering Europe's ambitious energy and climate goals are unproven and not easy to quantify once innovation, market liquidity, private contracting and investment impacts are taken into account.

25. While **nodal pricing** is not the solution to the current crisis, better locational signals and long-term incentives to invest in transmission and renewables in the right places are to be encouraged.

26. Future-proof legislation will need to not only enable the **integration** into the market of a higher share of renewables and flexibility, but also ensure that **market rules function** with a higher share of renewables.

27. **Hybrid offshore projects** can develop under the current EU legislative framework, but reforms will be needed to better incentivise them and ensure optimal **cross-border cooperation** and price formation. Likewise, the **remuneration model** for both project developers and operators of hybrid projects will require further regulatory certainty.



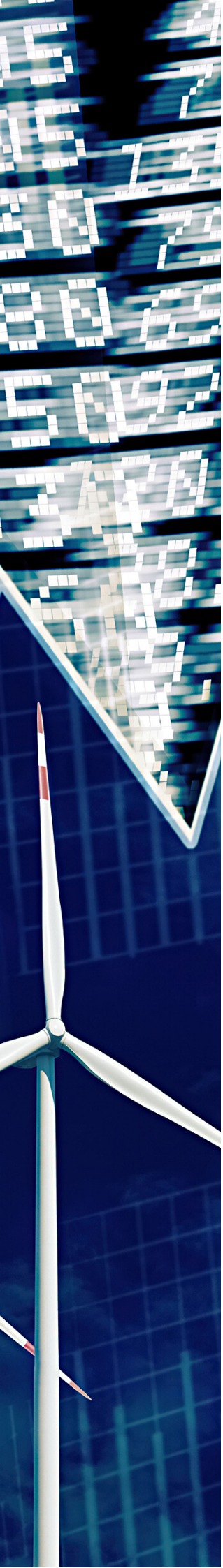
WHOLESALE MARKET RECOMMENDATIONS

TWO MARKET SOLUTIONS

28. **Two short-run markets** – one for on demand and one for as available power – raises difficult issues whereby market efficiency will almost certainly be reduced, potentially substantially. Such a solution should be rejected.

29. While two short-run market solutions make little sense now, they make even less sense in the **long-term** when power, heat and transport fuel markets will be fully integrated.

30. **Hybrid market solutions** which concentrate on locking in low long-term (often government-backed) contract prices for new low-carbon generation, while continuing with short-term private contracting for fossil fuel generation, make more sense. Thus, long-term **corporate, retailer or government PPAs**, often in the form of fixed price **CfDs** for an extensive period (say 15 years or more), can be sensible financial instruments.



WHOLESALE MARKET RECOMMENDATIONS

THE USE OF LONG-TERM PPAS

31. **Long-term PPAs** for low carbon **generation** are a proven way of financing investment and locking in fixed prices for a long period.

32. **Auction-based competitive PPAs** to bring forth new investment are a good way to introduce competition for all types of PPAs. The use of auctions for long-term PPAs combined with current short run power markets can lead to a desirable hybrid market arrangement, introducing **competition for the market** in combination with **competition in the market**.

33. **Corporate renewable PPAs** make sense for companies that are long-lived and can commit to, say, 15 years of purchasing the output of their generation counterparty.

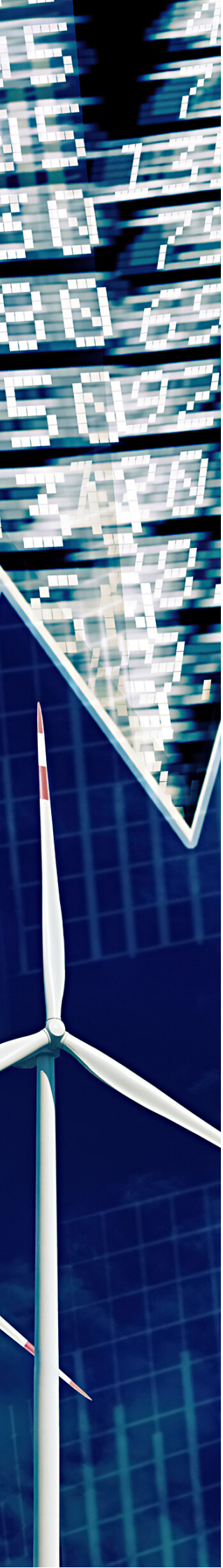
34. **Retailer PPAs** make sense for large incumbent retailers with relatively stable customer bases for part of their demand. Secondary markets for PPAs and additional risk regulation for retailers is likely to grow this market.

35. **Well-designed government PPAs** can significantly improve on older support schemes such as feed-in tariffs, by better reflecting incentives for short term efficiency and allowing procurement to occur via a competitive auction. The UK's Low Carbon Contracts Company provides an example of the **legal entity that governments could create** to procure low carbon power under fixed price long-term contracts.

36. Where **government PPAs** are used, the way they are implemented should ensure that **electricity consumers benefit from lower prices** when PPA strike prices are below market prices. This is the case with the LCCC arrangements in the UK.

37. Corporate and retailer PPAs will become increasingly desirable in the future as a way of **diversifying the contract terms** of the PPAs signed.

38. So far, legal barriers to corporate PPAs have stemmed from certain **national legislation**, not EU legislation. To remove such barriers, the **Renewable Energy Directive (RED II)** now contains some facilitating provisions that could be further reinforced as part of reform proposals.



WHOLESALE MARKET RECOMMENDATIONS

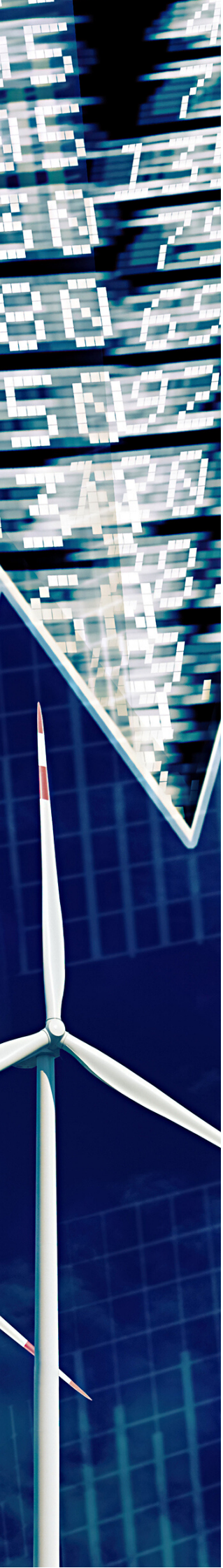
THE USE OF LONG-TERM PPAS

39. While the EU can **recommend the use of PPAs** and make **observations** on which types of PPAs have worked well (e.g. by publishing a best practice guide in a non-binding guidance document), it would be **unwise** to recommend the use of a **standard PPA** contract to cover a **fixed proportion** of all national output.

40. If the EU wants to support government PPAs and facilitate their approval under state aid rules, it should clarify the **acceptable design features** of these agreements in the **state aid guidelines** for climate, environment protection and energy.

41. Whether and to what extent Member States provide long-term government backed financial PPAs should be left to the **subsidiarity principle**, and depends on the preferences of individual Member States. Clarifications as to best practices and favoured approach to avoid market distortions can be provided by the European Commission.

42. The signing of PPAs with **existing generation** on a voluntary basis will not offer significant reductions in discounted prices (energy costs) for consumers.



WHOLESALE MARKET RECOMMENDATIONS

COMPLETING AND EXTENDING THE SINGLE MARKET IN ELECTRICITY AND GAS

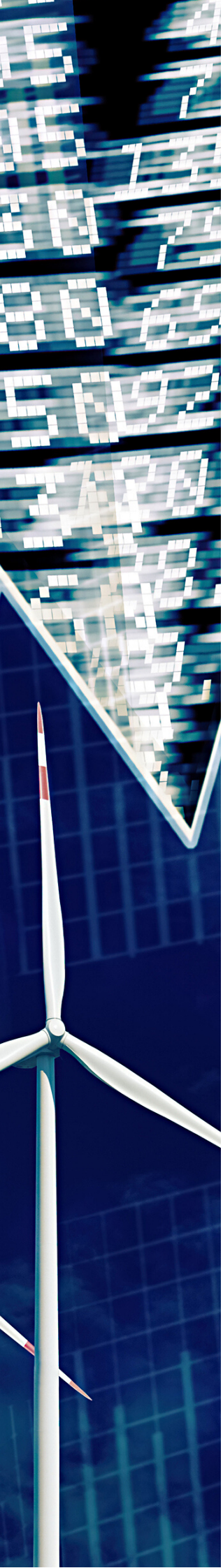
43. As emphasized in the first section, the European Commission should continue pursuing the **completion and extension** of the internal energy market. Full and correct **implementation of existing EU legislation** should be a priority area for the Commission and the Member States, and a prerequisite to the adoption of additional harmonised requirements.

44. A further priority is to speed up the provision and use of **physical two-way transfer capacity** in gas and electricity within Europe. This can notably rely on the use of both existing and newly established solidarity mechanisms between Member States. It is fundamental that enough **cross-border interconnector capacity** is made available for trade to reduce localised price spikes or supply shortages.

45. The regulation of **capacity remuneration mechanisms (CRMs)** has already been streamlined at EU level, and harmonisation efforts should be kept up in order to prevent the use of these mechanisms from raising barriers within the internal energy market. The inefficient coordination of capacity markets raises total European electricity system costs.

46. Action should be taken to **remove remaining trade barriers in energy** between the EU and neighbouring third countries such as the UK, Switzerland and Morocco. The EUPHEMIA market coupling algorithm could easily be extended to include these countries.

47. Market design solutions should be compatible with cross-border cooperation with non-EU countries, to ensure a **broader area of energy cooperation** and security of supply around EU territory.



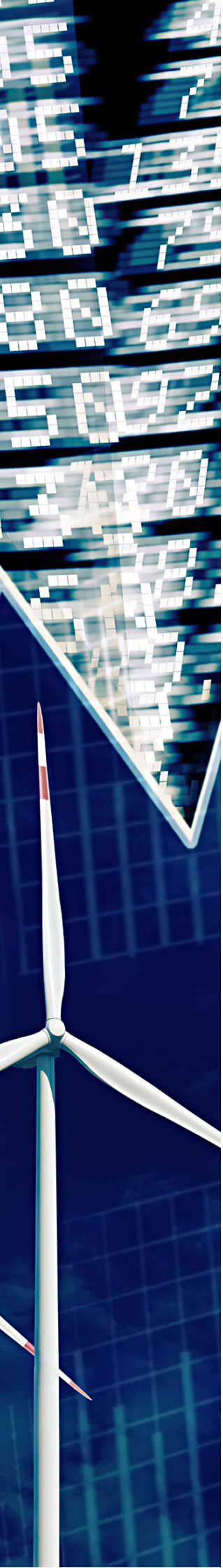
WHOLESALE MARKET RECOMMENDATIONS

DEALING WITH EXCESS GENERATOR PROFITS

48. In the current extreme circumstances, sensible measures to recoup **excess generator profits** – where these exist – are essential to address concerns about economic justice.
49. This is best done through **non-discriminatory profits taxes** which target excess profits and do not blunt incentives to efficient dispatch. Profits taxes should be targeted on inframarginal rents wherever possible. High profits tax rates are preferable to arbitrary price caps on certain types of generators.
50. Excess generator profits taxes should be directly **recycled to consumer bills** and direct income support in order to finance bill reductions and hence mitigate the inflationary effects of high average wholesale market prices.
51. Similarly, positional rents from renewables can be extracted via **site auctions** (e.g., for access to the seabed), auctions for long-term PPAs, and profits taxes.
52. However, excess profits taxes should be imposed for **no longer than necessary** and governments should clearly frame the temporary nature of such measures.

LINKING WHOLESALE AND RETAIL PRICES

53. It is therefore important that **wholesale prices are reflected in retail prices at the margin**. Ensuring that consumers have a strong incentive to reduce energy consumption, even while they may be receiving generous bill support, is critical for actually addressing the crisis.



RETAIL MARKETS RECOMMENDATIONS

THE NEED FOR DESIRABLE CHANGE

54. We need to facilitate behavioural change in **energy consumption** that increases energy efficiency and supports the energy transition.

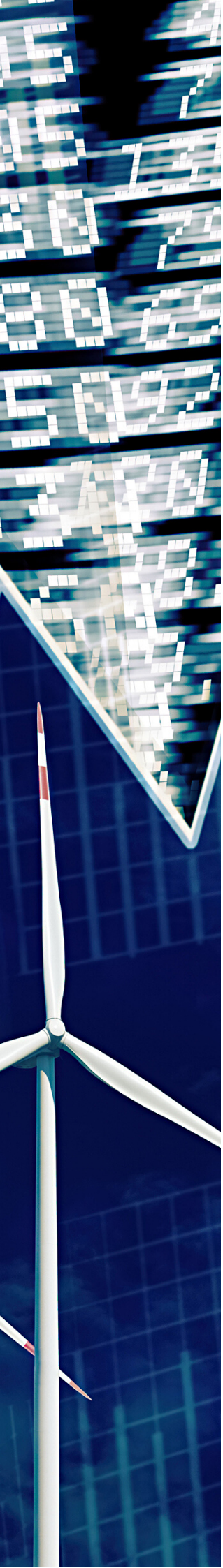
55. All European countries need to engage in **campaigns** to reduce demand and have associated **tariff settings** which encourage large reductions in consumption for non-vulnerable customers.

56. Large amounts of **distributed installation** can be done relatively quickly with beneficial aggregate demand and fiscal effects. Prosumption should be further facilitated through regulation, particularly where regulatory barriers have been identified.

57. **Smart meters** need to be used more effectively in an energy crisis to encourage demand reduction and demand management, and more needs to be done to work towards **smarter contracts** which could be used to engage in deep demand reduction.

MINIMISING THE IMPACT OF ENERGY PRICES ON INFLATION

58. Countries should look carefully at how bill support can be paid in such a way as to also reduce the **measured inflationary impact** of energy prices, so that fiscal measures to support consumers also reduce the contribution of energy price inflation to general inflation.



RETAIL MARKETS RECOMMENDATIONS

COMBINING DEMAND REDUCTION, LINKAGE TO WHOLESALE PRICES AND EQUITABLE ENERGY BILLS

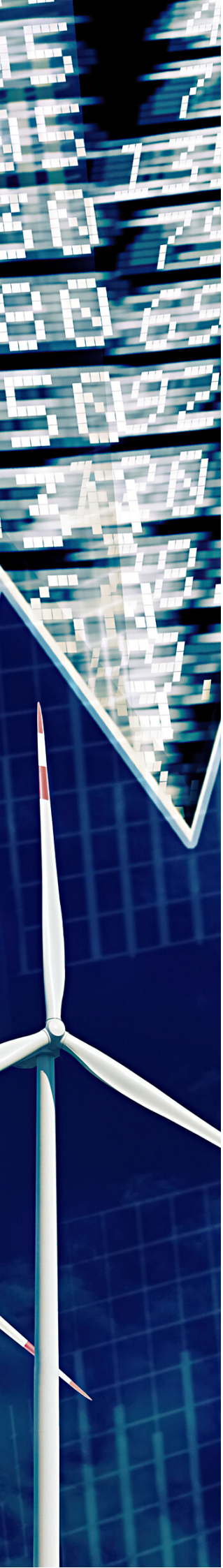
59. Equitable compensation of retail bills is important. It should, however, be combined with high marginal prices for the final uses of energy. **Rising block tariffs** could be more generally applied to electricity at the Member State level.

60. Governments should build **integrated welfare and energy data systems** that deliver effective and timely financial support to consumers. This would allow direct adjustments to bills on the basis of need, temperature and wholesale prices as well as allowing mitigation of inflationary impacts.

61. Retailers need to design **tariffs** that allow customers to hedge market risk while encouraging demand flexibility and energy conservation.

62. A possible solution is to encourage (or mandate) the development of **retail contracts** that lock in part of the energy consumption at fixed prices while retaining some price variation on the margin. One way to do that would be to combine real-time pricing with an insurance contract that offers financial difference payments for a fixed quantity of energy.

63. Tariff models by which retail prices are calculated can help **stabilise bills** by allocating the benefits (and costs) of fixed-price long-term contracts to all consumers or a particular group of these.



RETAIL MARKETS RECOMMENDATIONS

REGULATION OF RETAIL OFFERS

64. **Stricter requirements** on the financial position of suppliers are likely warranted, including supplier stress-testing and specification of minimum forward hedging requirements. Regulators should ensure that suppliers are prepared for price shocks they might face.

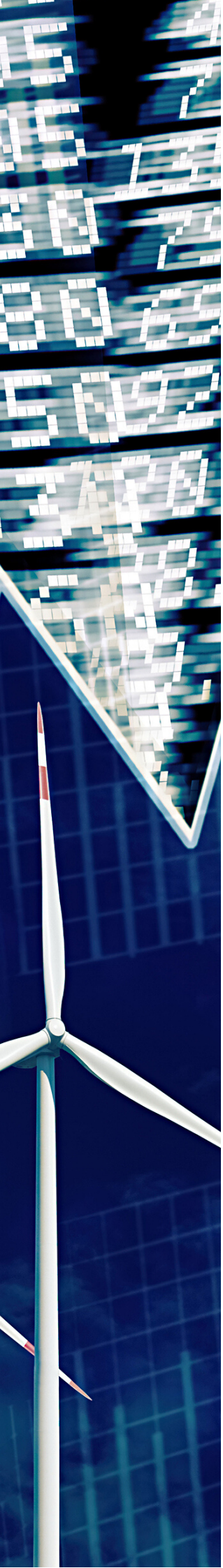
65. Consumers must, to some extent, be held **responsible for their choice of supplier** – otherwise the door would be wide open to offers that are "too good to be true" – but they must also have ways of entering a new contract on reasonable terms when warranted.

66. Finding the right trade-off between a sound system for **customer protection** and **financial regulation** of suppliers should be a priority for national energy regulators.

67. Another important trade-off in the retail market is balancing competition and innovation versus stability. **Regulation of contractual terms** must be carefully considered, given that the availability of contract types and the terms on which they may be offered are closely related.

68. Regulation of contractual terms should better balance the incentives of suppliers to offer longer term contracts and the need to protect consumers from being unfairly locked into longer term contracts, with the aim of **encouraging longer term contracting**.

69. Good commercial practices corresponding to national circumstances should continue to be the preferred approach (supported by standard agreements), while the requirements for **hedging of suppliers** should be reinforced via harmonised EU legislation.



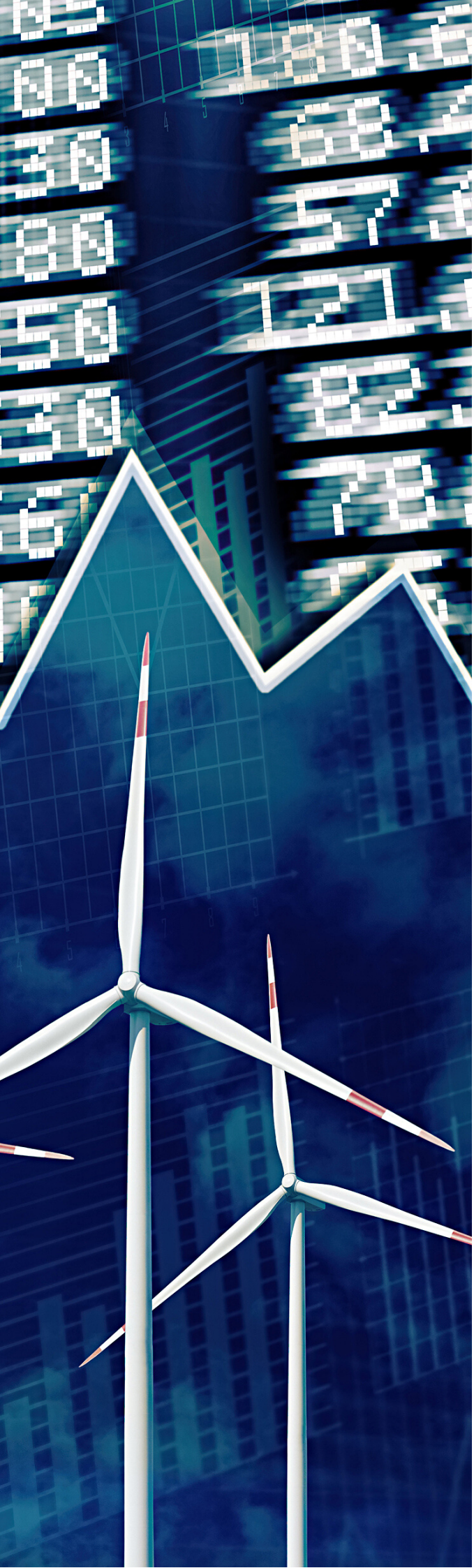
RETAIL MARKETS RECOMMENDATIONS

THE MONITORING OF RETAIL'S EFFECTS ON THE WIDER SINGLE MARKET IN ENERGY AND OTHER GOODS

70. The impact on **aggregate European demand** for electricity of highly subsidised marginal prices of electricity consumption in one country does produce negative externalities for the citizens of other European countries. The EU should **intervene** where retail market interventions are increasing European wholesale market demand.

71. Market interventions which have large detrimental **cross-border effects** should be prevented. It is therefore to be welcomed that the EU has recently implemented regulation to reduce electricity demand across Europe, as this will encourage member states to have suitably **cost-reflective marginal consumer electricity prices**.

72. Meanwhile, retail market interventions which differentially impact Member State commercial and industrial prices have competitive effects and should raise standard **state aid concerns**.



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