

The Industrial Agenda for Energy and Climate Policy for the Turn of the Century

We are at a decisive moment for Europe. The energy crisis threatens to seriously impair the international competitiveness of large sectors of industry. At the same time Europe, and especially Germany, must find a suitable response to a new industrial policy by leading economies.

While the US has just announced the "biggest investments ever for climate protection" with the Inflation Reduction Act (IRA), and is channelling hundreds of billions of dollars into building and expanding its future energy economy and manufacturing industry, the EU has primarily focused on countering the effects of the crisis, and on the gradual further development of the European Green Deal as a transformation framework. China has long supported domestic production of climate-friendly technologies. Japan, Korea and India are also planning more incentives for investment, and support for their domestic industries.

The European Union (EU), and especially Germany, as its largest economy, are therefore faced with a challenge to rethink their industrial strategy. It is true that it was possible to react to the acute energy crisis with immediate measures, and billions in support. But the foreseeable higher energy costs in the medium term call into question the sustainable competitiveness of industry, and endanger social prosperity. In the economic competition of the future, and in an increasingly fragmented global economy, Europe is well advised to rely on the sustainable locational advantage of low-emission industrial production, instead of risking deindustrialisation.

The transition to climate neutrality must be fair and based on partnerships. At the national and European level, this means that in the face of the rising and expanded CO₂ price signal, revenue from the European Emissions Trading Scheme, and the new trading schemes for transport and buildings, are used to provide relief for low-income, vulnerable households.

A fair transition at the international level means using a holistically conceived external energy and climate policy, to prevent partner countries (especially those in the global South) falling into undesirable dependencies in order to meet Europe's requirements, which Europe itself is trying to avoid, and put its own energy transition on the backburner.

With the reform of the Emissions Trading Scheme (EU ETS) as part of the Fit for 55 package as a milestone, Europe already has an effective, established climate policy guiding instrument. In February 2023, CO₂ allowances reached a record price of 100 euros per tonne. The EU ETS thus sets clear incentives to drive the decarbonisation of economies, and thus create a competitive market for sustainable technologies. In Japan, the introduction of an ETS system is now being intensively discussed as a reaction to the IRA. However, even at this price level, the EU ETS will not be sufficient to stimulate a number of innovations needed for climate neutrality (eg. switching from natural gas to hydrogen power plants, CCS, feedstock switch).

A smart industrial agenda for Germany and Europe should tie in precisely with this. The next few years will be crucial to create the basis for sustainable economic growth for the decades after the crisis with innovations and target-oriented framework conditions.

It is now necessary to switch from the short-term appropriate "survival strategy", in the midst of the acute crisis, to an industrial policy strategy guided by socio-ecological market economy principles for the dawn of the new era. To this end, EPICO KlimaInnovation proposes ten points.

1. Secure European technological leadership for transformation and future technologies, avoid subsidy spirals.

- Germany and Europe have the opportunity to use the transformation to achieve climate neutrality and lay the foundation for sustainable prosperity and more sovereignty. Positive signs of this are growing private investments in transformation and future technologies of strategic importance.
- The unleashing of a broad subsidy spiral and protectionist measures in Europe in response to the IRA should be avoided, due to their questionable effect on competitiveness in Europe as a business location, as well as the high trade policy risk associated with them. Instead, a focus of the EU Green Deal industrial plan should be on reducing high import dependence on individual trading partners with a view to European security and resilience. However, excessive import substitution of key products for the energy transition in the face of sufficiently diversified supply is counterproductive, as it would further increase the costs of the transition.
- Currently, rare materials such as lithium, cobalt, nickel, and graphite, used in electric car batteries, wind turbines and electrolyzers, are imported at 100 per cent (Grohol and Veeh, 2023). In addition, there is a high concentration of Chinese processing capacities for critical and strategic raw materials. Germany and

Europe could establish themselves as a location where technical innovations are developed and brought to market, using significantly fewer critical raw materials. In addition to an import strategy geared towards diversification and sustainability, it is also important to strengthen European raw material extraction and the circular economy. This offers opportunities for industry to reduce material costs and energy demand, while securing its international competitiveness. From an ecological perspective, local environmental impacts can be minimised, and international dependencies reduced.

- The EU should further strengthen the European Single Market with a view to transformation and future technologies. This includes a future-proof electricity market design, clear standards, certifications, public procurement of green products that also support the development of lead markets, accelerated planning and approval procedures, and the broader application of regulatory "sandboxes" with a view to innovation-friendly regulation. EU funds should be used in a targeted way to leverage private capital, and focus on innovation to increase the EU's strategic resilience along key value chains.

2. Accelerate the expansion of renewables and grids to reduce energy prices and strengthen security of supply.

- Fossil fuels should be replaced as quickly as possible with a market-based, efficient expansion of renewable energy sources (RES), so that consumers can benefit from the low costs of these technologies.
- In addition to increasing efficiency and electrification of economic sectors, the development of material, storable energy sources, in the context of building a hydrogen economy, plays a crucial role in the transformation to climate neutrality. Natural gas will remain an important component of the energy supply for the transition period of the necessary hydrogen ramp-up, which is estimated to last several years.
- The basic prerequisite for success is the prioritisation and acceleration of planning, approval and development for generation plants and grid infrastructure. The goal should be to transfer and consolidate the success in accelerating the construction of LNG import terminals to the renewable, electricity grid and hydrogen grid expansion at the federal and European level. This should happen by establishing more efficient processes, with more personnel within the relevant authorities, and with more prioritisation.
- The accelerated expansion of renewable generation capacities should be complemented by measures that encourage flexibility and investments in

storage. Granular Europe-wide green power certificates should also be used for this purpose.

3. Limit market intervention in energy prices in the current crisis.

- Technology-specific random profit skimming is detrimental to the expansion of renewables, and hinders the ramp-up of hydrogen by undermining investment security.
- These market interventions should expire automatically, and not be renegotiable at clearly defined points in time, in order to ensure planning security.
- The EU should maintain sufficiently strong price signals to enable the necessary expansion of renewables.

4. Build on the successes of the EU internal market, instead of rolling them back.

- During the crisis, the internal energy market has been successful in achieving large savings through price signals, and in efficiently distributing electricity between member states in extreme situations. In view of the integration of increasing renewable generation capacities on the way to climate neutrality, the "merit order" becomes even more important to ensure efficiency and stimulate innovation. However, the current electricity market design, and its short-term price signals, need to be supplemented, as part of a reform geared towards decarbonisation, economic efficiency and security of supply.
- Efficiency gains from cross-border electricity trade should be maintained and expanded with further cross-border interconnection capacities, as it would be extremely costly and inefficient for each member state to ensure security of supply on its own. A withdrawal of generation capacities from the internal market through energy policy renationalisation must be prevented.
- A new electricity market design based on the merit order should be made future- and crisis-proof, through more long-term innovation- and system-oriented contracts in the form of standardised direct contracts (PPAs), and "base-load or financial CFDs" where necessary.
- In view of the acceleration of the transformation and the reduction of controllable capacity, as well as the need to build new capacities in an extremely uncertain market environment, capacity mechanisms are becoming a necessary building block for a reliable electricity system. When designing them, it is crucial that storage facilities and decentralised flexibility is also efficiently integrated. This speaks in favour of a decentralised capacity market, in which flexible consumers and the multitude of different technologies are better

integrated than in centralised models, which provide fewer incentives for innovation and flexibility.

5. Drive forward the digitalisation of the energy system to leverage flexibility potential.

- The short-term balancing of electricity supply and demand must also be strengthened through flexibility. To this end, it should be possible to integrate decentralised consumption and generation units into the energy system as active market participants. Electric vehicles, heat pumps and electrolyzers for system services, and including the integration of decentralised units such as PV systems and PV home storage in local, regional or national electricity trading markets, represent an enormous flexibility potential that has remained untapped so far. The flexibilisation of industrial processes, and the development of heat and cold storage facilities, are also important building blocks in this context.
- Smart metering systems and flexible tariffs for market integration should hence be introduced rapidly, with a clear roadmap for introducing variable grid charges. Market instruments for the use of flexibility should take priority, and direct control interventions by grid operators should be avoided.
- The regulatory framework contained in the EU Clean Energy Package is a milestone for the flexibilization of the demand side, and must be implemented consistently. Demand-side management enables consuming households and businesses to save money. The aggregation and integration of flexibility in all markets form the basis for new business models.
- Today there is still a digital gap in the technical requirements for systematic market integration and the use of grid-serving contributions from decentralised plants, which urgently needs to be closed. The current practice of switching plants to the market in paper form slows down the digital energy transition. The lack of digital proof of identity is one of the most pressing obstacles to digitalisation – not only for the energy industry – and must be remedied through decentralised solutions. Households and companies should be able to make autonomous decisions about the use and management of their device data.

6. Pragmatically accelerate hydrogen ramp-up.

- Large regions within the international hydrogen market are "colour-blind". In global competition, Europe can no longer afford detailed discussions about additionality or simultaneity. The EU must take stock of the approach of the American IRA and accelerate the ramp-up of the hydrogen economy pragmatically, efficiently and in a targeted way.

- In order to provide a sufficient supply from the beginning, and to accelerate the expansion of the necessary infrastructure, it should be possible to use low-carbon hydrogen as well as green hydrogen during the ramp-up phase. Subsequently, a smooth transition to the exclusive use of green hydrogen is necessary, and it must be a guiding target for hydrogen policy.
- To overcome the chicken-and-egg problem, we must develop an infrastructure plan that maps the expected future demand. National and European development plans must be coordinated. To this end, EU network development plans should be binding on member states.
- Bipartite climate contracts (CCfDs) should be introduced for a limited time for clearly defined industrial applications, in addition to national and European CO₂ pricing and a border adjustment on products manufactured outside Europe (CBAM). The aim should be to reduce market risks in the initial phase.

7. Increasing competitiveness through a European Hydrogen Union.

- Closer European cooperation is necessary to support intra-European hydrogen projects, and the development of a European transport infrastructure.
- For non-European imports, especially in the geographical neighbourhood, European interests should be bundled with EU energy partnerships that support the energy transition in Europe as well as in non-European supplier countries. This also includes the formulation of sustainability standards with regard to on-site hydrogen production.
- In order to import the greatest possible amount of hydrogen, and at the same time advance a sustainable global hydrogen market, the European Hydrogen Bank should rely on a combination of demand-side auctions with default guarantees for producers in order to reduce investment risks and compete for initially scarce hydrogen (Lotz and Klessmann, 2023).

8. Use carbon capture and storage for industrial transformation.

- A European embedded CCS and CCU strategy is necessary to address unavoidable residual emissions and to enable innovation and investment. Framework conditions must be created for the capture, transport and offshore storage of CO₂ in foreign and, prospectively, domestic storage facilities, which are lacking in Germany, unlike in Nordic countries, the UK, or the US.
- The EU and its member states should set concrete targets for storage capacity, transport infrastructure and stored quantities by 2030. On the one hand, this creates a necessary level of reliability for industry to make investments and catalyse action at Member State level. On the other hand, it is important to create

acceptance for the technology (Glanz et al., 2021). A CO₂ transport network should be planned and advanced to connect CO₂ emitters with possible offshore storage sites domestically and abroad.

- Research and development in CCUS must be further strengthened, priority application fields identified, and steps for an accelerated market ramp-up defined. Germany should move forward in this framework with European partners to advance an "Important Project of Common European Interest" (IPCEI) on CCS based on the successful models for microelectronics, batteries and hydrogen.
- For as long as necessary, in addition to the incentives provided by the EU ETS and a sensible framework, temporary contracts for difference should be used to ramp up CCS for unavoidable emissions. At the European level, the ETS Innovation Fund and the Connecting Europe Facility can be used for this purpose.

9. Establish climate clubs, promote decarbonisation and international cooperation.

- Stronger international sectoral cooperation through alliance-building should play a greater role in decarbonising industry by setting ambitious targets, sharing knowledge and best practices, improving policy frameworks, discussing opportunities for cooperation between developed and developing countries, and avoiding trade conflicts.
- The current climate club approach, which focuses solely on expanding CO₂ pricing, should therefore be pragmatically replaced by a flexible sectoral and rapidly implementable approach with clear targets, rights and obligations to support the goals of the Paris Climate Agreement.
- As the G7 has already laid the groundwork for the idea of creating a climate club in recent months, the focus is now on the approach of advancing international alliances in specific sectors. Given the emissions profile, the volume of trade and the need for cross-border definitions and standards, sectors such as steel and cement lend themselves to this. The establishment of a climate club can also play an important role in the production and international trade of green hydrogen, for example.
- In the discussion, it is important to separate the border adjustment mechanism in the form of the EU's CBAM from an open and inclusive international climate club. References to the climate club as a substitute for the CBAM adopted at the EU level are misleading, and hinder constructive discussions on the design of an ambitious international climate club.

10. Use transformation funds to mobilise private capital.

- The great need for action on emissions reduction goes hand in hand with a large investment gap that the state cannot close through public financing. Instead, the German government should create suitable framework conditions and remove barriers to investment.
- With a view to "first-mover disadvantages", incentives should be created to leverage the necessary private capital for modern and sustainable infrastructure, skills and technology development. When designing transformation finance, public funds should be strategically used as "blended finance" to specifically change the risk-return trade-off and enable private investment. This enables the financing, for example, of necessary technological leaps for the transformation of industry with significant market risks in the short and medium term, and also allows more equity and debt capital to flow into innovation funding.
- In this sense, a transformation fund should specifically close gaps in the current funding landscape and focus on sustainable business models in SMEs and the scaling of technologies and business models that have already left the laboratory scale and become large-scale.

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