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Tom Krebs

# A New Era in Industrial Policy

## Toward a European Inflation Reduction Act

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# PREFACE

In recent decades, the discussion of industrial policy has been highly charged ideologically and frowned upon, especially in the field of mainstream market-liberal economics. Nevertheless, industrial policy has been practiced throughout the years in all developed economies, however cautiously. The past years, characterized by exogenous shocks and increased pressure to take action to tackle the climate crisis, have challenged economics and economic policy to rethink its course. Thus, "the policy that shall not be named" (Cherif & Hasanov 2019) is returning to the policy debate to offer solutions for the transformation of the economy.

Thus, the progressive German government that came into office in 2021 set about developing a new industrial strategy while setting ambitious climate goals in its coalition agreement. Respective measures aimed at fighting climate change at home include phasing out coal as an energy source by possibly 2030, eight years ahead of the original schedule, meeting 80% of demand for electricity with renewables within less than a decade and putting 15 million electric vehicles on German roads by 2030. The agreement also proposes phasing out gas for power generation by 2045 and setting a minimum carbon price of € 60 per ton.

However, it was unclear at the time that this ambitious plan would come under additional pressure. The drastic geopolitical and geo-economic consequences of Russia's invasion of Ukraine on 24 February 2022 were unseen and unforeseen. The German Chancellor Olaf Scholz called it nothing less than "*a watershed*" (*Zeitenwende*), "And that means that the world afterwards will no longer be the same as the world before. […] Whether we permit Putin to turn back the clock to the nineteenth century and the age of the great powers. Or whether we have it in us to keep warmongers like Putin in check. That requires strength of our own."[1]

Strength of our own – that also meant in particular drastically reducing economic independence, starting with gas supplies from Russia that needed to be cut. Cheep gas was one main pillar of Germany's economic success. The need for an enormous acceleration of the economic transformation of German industry is the ultimate consequence that makes fast and effective industrial policy more necessary than ever.

At the same time the United States is focusing on rebuilding its own economy – in particular its manufacturing sector – setting course to reunite a divided country by introducing a huge subsidy package for green industries – the Inflation Reduction Act. As much as the American return to climate action was welcomed by Europeans, its financial scope and non-bureaucratic accessibility put the German government and the European Commission under even greater pressure to act.

This study explores the Inflation Reduction Act as an industrial policy instrument and contrasts it with European industrial policy to date. The author makes recommendations for an overhaul of German and European industrial and climate policy, which he derives from a well-founded critique of market liberalism.

I hope that this study will provide you with interesting reading and offer valuable suggestions for a European debate on industrial policy.

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1 Speeches on a watershed, Federal Chancellor Olaf Scholz, https://www.bundesregierung.de/resource/blob/992814/2131062/78d39dda6647d7f835bbe76713d30c31/bundeskanzler-olaf-scholz-reden-zur-zeitenwende-download-bpa-data.pdf

# 1 INTRODUCTION

The United States' recently enacted Inflation Reduction Act (IRA), which includes hundreds of billions in federal subsidies for green technologies and renewable energies, marks a long-overdue shift[2] in US climate policy. The European reaction to this realignment of US policy, however, has been mixed. While the US decision to join the global fight against climate change was well received in the European Union, some leaders have voiced concerns that the bill focuses too much on domestic production and might discriminate against EU-based companies.

This study explores the IRA from a climate and economic policy perspective. In addition, recommendations are derived on how policy-makers in Germany and Europe could or should respond to the IRA. The key results of the study can be summed up as follows:

In principle, the IRA is the right approach to managing a just transition to a climate-neutral economy. It boils down to a modern version of industrial policy that supports business enterprises and workers in the climate transformation process. This approach compares favourably to the European approach to climate policy, which uses carbon pricing as the key policy instrument and therefore puts the punishment of people and companies for "bad behaviour" centre stage. The European criticism of the IRA is mainly based on a market-liberal paradigm that harks back to a vanishing, neoliberal era. Germany and Europe should therefore welcome the U.S. foray and respond in turn with a European IRA.

Although the IRA is in general the right approach to climate policy, it also has significant weaknesses in terms of policy design. Germany and Europe should therefore not simply replicate the IRA, but instead develop an improved version of their own. This means, among other things, exploiting the institutional strengths of the German and European labour markets. After all, the IRA is also an attempt by the Biden administration to establish a good-jobs economy in the U.S.. For example, the IRA allows for bonus-subsidies if companies pay the "prevailing" wage rate. This kind of good-jobs policy is in principle a good way to boost wages and improve the efficiency of production. It is, however, difficult to implement such a policy in a country like the U.S. that lacks collective bargaining agreements in many sectors. Germany and Europe should leverage their institutional framework of Social Partnership to launch their own version of a modern industrial policy that puts good jobs centre stage.

Specifically, at the European level, the following measures should be part of a European response to the IRA:

— **European projects:** Expand the support for strategically important projects in the area of climate transformation while at the same time simplifying the funding process.

— **State aid rules:** Make EU state aid rules more flexible with regard to national programmes to facilitate simple and SME-friendly support for private investment in renewable energy sources and the decarbonisation of industry.

— **Good jobs:** Strengthening of European initiatives in the field of education and training as well as providing guidelines for policies that combine investment subsidies with good-work (good-pay) conditions.

— **Electricity prices:** Reform the European electricity market to ensure competitive electricity prices in the EU.

— **Financing:** Create additional funding opportunities so that all EU Member States can implement a modern industrial policy.

— **Trade:** Conclude additional industrial trade agreements with North America and other regions; avoid "buy Europe" policies (local content rules) and other forms of protectionism; provide additional EU funding to countries in the Global South so they can develop their own version of modern industrial policy.

The European response to the IRA should be coordinated at the EU level, but Member States can also help make European industrial policy successful by means of national measures. In particular, the German government should lay the foundation for a modern industrial policy by taking the following steps.

— **Climate-neutral investments:** Speedy enactment of tax incentives for climate-neutral investments as laid down in the Coalition Agreement of the current German government ("super write-offs").

— **Good Jobs:** Combine investment subsidies with good-work (good-pay) conditions – additional subsidies for companies that pay union wages; speedy implementation of the planned Federal Collective Bargaining Act (*Bundestariftreuegesetz*); increase subsidies for on-the-job training and apprenticeship programs.

2 https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/

— **Electricity prices:** Support the European efforts to reform electricity markets and immediately introduce a program that ensures competitive electricity prices for industrial users.

— **Financing:** The funding of measures to conduct modern industrial policy in Germany needs to be secured in line with the constitutionally enshrined debt brake (balanced-budget rule).

From the perspective of this study, the IRA represents a central component of a modern approach to climate policy. This approach puts public infrastructure investment (Bipartisan Infrastructure Bill) and support of private climate investments (Inflation Reduction Act) centre stage, and explicitly links these investment policies to good-jobs conditions. In a nutshell, it is the Green New Deal with a strong pro-worker bent. The U.S. foray into climate policy offers Germany and Europe an opportunity to successfully craft its own version of a modern industrial policy that lays the foundation for a successful climate transformation.

The above policy measures constitute the key elements of a modern industrial policy. In addition, the German government needs to spell out, in tandem with its European partners, a coherent net-zero industry plan in detail and communicate it clearly to all actors. In short, plan beats no plan.

# 2
# INFLATION REDUCTION ACT AND EU CLIMATE POLICY

With the passage of the Inflation Reduction Act (IRA), the U.S. is back in the ring in the fight against climate change. The IRA is a package of policy measures seeking to foster climate-friendly production and investment. This chapter describes and analyses the main components of the IRA, and contrasts it with the general approach of the EU to climate policy as well as the specific EU programmes.[3]

## 2.1 INFLATION REDUCTION ACT (IRA)

U.S. President Joe Biden signed the Inflation Reduction Act 2022 (IRA) on 16 August 2022. This legislative package is at the heart of the Biden administration's climate policy agenda and, in addition to reducing greenhouse gas emissions, is intended to ensure that production capacities for climate-neutral technologies are established in the U.S.. Following the roll-out of the "Bipartisan Infrastructure Bill" and "Chips & Science Act", the IRA is now the third package of policy measures centred on strengthening the U.S. manufacturing base. The three pacts have a combined government funding volume of around U.S. $ 2 trillion spread out over the next ten years. The IRA by itself will provide an estimated U.S. $ 370 billion in funding.[4] The funding measures are to be financed by raising the minimum tax for business enterprises, closing tax loopholes and reforming the pricing of drugs and medication.

The IRA encourages climate-neutral investment and production through a combination of tax breaks (tax credits), direct subsidies and low-interest loans (White House, 2022a). Table 1 shows the main elements featured in the package of measures.

At the centre of the debate in Germany and Europe are Buy American or Local Content requirements that are to be applied as criteria for the award of tax credits for certain products. For example, buyers of electric cars receive a rebate of up to U.S. $ 7,500, but this incentive is only granted if several conditions are met. Specifically, final assembly of the e-car needs to take place in North America, part of the upstream materials for the battery need to come from North America or a country with a

**Table 1. Estimated funding (in billions of U.S. dollars) provided through the IRA**

| | | |
|---|---|---|
| **CO2 -free energy production** | — Tax credits for investments in solar energy systems<br>— Tax credits for wind and nuclear power generation<br>— Promotion of supra-regional transmission grid projects<br>— Promotion of energy efficiency measures | **196** |
| **Manufacturing industry** | — Promotion of modern production facilities<br>— Investments for modern industrial plants | **71** |
| **Electric mobility** | — Tax incentives for the purchase of electric vehicles<br>— Promotion of electric vehicle charging infrastructure | **23** |
| **Climate-friendly technologies** | — Tax credit for C0 cut-off2 and DAC<br>— Tax credit for production of climate-friendly hydrogen<br>— Promotion of hydrogen and DAC hubs<br>— Promotion of sustainable aviation fuels | **17** |
| **Other** | — Agricultural initiatives<br>— Methane emissions tax<br>— Investment in measures promoting resilience (rural areas)<br>— Greenhouse gas reduction fund | **61** |

Source: BDI (2023)

3 See Agora (2022), BDI (2023) and Bruegel (2023) for additional analyses of the IRA and corresponding European funding programmes.

4 These estimates of funding volume are highly uncertain because the programmes are not capped in terms of their volume, and the actual funding volume depends on the take-up rate by companies and households.

free trade agreement with the U.S., and part of the battery components needs to be manufactured or assembled in North America. In terms of actual implementation, these requirements can lead to considerable red tape, which seems to run counter to the otherwise rather unbureaucratic approach of the IRA. Moreover, they are most likely in violation of the free trade rules of the World Trade Organisation (WTO).

One central aspect of the IRA is its aim to improve working conditions for U.S. workers. Specifically, subsidies are in part pegged to wage levels – enterprises that pay the "prevailing" wage are to receive an extra bonus (White House, 2023b). On top of this, investment subsidies are coupled with the training of skilled workers and use of apprenticeship programs. The declared aim and objective of the Biden Administration is to create well-paying jobs. In this sense, the IRA is also a good-jobs package. This point is scarcely touched upon in the public debate in Germany and Europe,[5] even though it plays an extremely important role for the Biden Administration (White House, 2023b).

## 2.2 CLIMATE AND ECONOMIC POLICY OF THE EUROPEAN UNION

The EU's climate and economic policy is based on the notion that government support for private activities – subsidies including tax breaks – usually distorts competition and therefore harms the economy. Hence, the Treaty on the Functioning of the European Union (TFEU) is based on the presumption that state aid is in general bad for economic prosperity, and thus stands in stark contrast to the climate policy approach of the U.S.. The key climate policy instrument is a uniform and sufficiently high price for CO2 so that market prices commensurately reflect climate costs caused by different modes of behaviour.

Of course, the ban on state aid does not apply without exception, and state aid in the areas of research and development (innovation policy), regional policy or energy and environmental policy are considered appropriate under certain conditions. In addition, in recent years the EU has instituted numerous special programmes in response to the various/diverse crises. In a certain sense, the exceptions have become the rule. However, policy discussions and actual policy decisions in the EU are still very much dominated by the market-liberal benchmark in which any type of state aid is to be considered with suspicion.

In aggregate terms, the EU funding volume for climate-related measures is estimated at € 645 billion over the years 2021-2027, with slightly less than € 100 billion being earmarked as direct support for private investment or innovation (BDI, 2023). Thus, the lion's share of support is in the form of low-interest loans. In addition, EU subsidisation schemes – in contrast to the IRA – are usually capped and EU funds are sometimes used more than once in different programmes. According to the EU budget, the main sources of funding are the NextGenerationEU programme (Build-up and Resilience Facility, ReactEU, Horizon Europe, InvestEU) and REPowerEU (ETS Innovation Fund).

This shows that the EU has launched by now a number of relatively large-volume support programmes for climate-neutral investments, but these programmes display significant differences compared to the IRA. In particular, the bulk of EU funding promotes public infrastructure investment, which is more in line with the "Bipartisan Infrastructure Bill" in the U.S. Further, a large part of the EU funding comes as low-interest loans, whereas the IRA seeks to encourage private investment in decarbonisation through tax credits and grants. Moreover, the following four differences can also be identified:

First of all, the EU funding process is fraught with red tape and time-consuming. One consequence of this is that SMEs and structurally weak regions tend to receive a smaller portion of funding resources.[6] The funding process is also complex due to the EU rule that all planned measures bearing relevance to state aid must be reported to the European Commission by the Member States or even formally notified by them and approved by the Commission.[7] Above and beyond all this, most EU funding and German subsidisation of industry as well is project-related, with technical experts at the respective ministries or in the European Commission evaluating individual project applications according to an intricate points system and then making the respective decisions on funding. In contrast, the IRA is a programme based on relatively simple rules that are evaluated ex post, if one puts aside the local content rule that is rather complex in its implementation.

Secondly, the EU still lacks a plan for a coherent industrial policy that can offer stakeholders orientation. One consequence is that project-based subsidies with detailed evaluation of individual applications is the rule (micro-management), but no overall European plan with clearly specified criteria for evaluating success exists at the macroeconomic level (micro-management without macro plan). The European Commission's initiative to develop a Green Deal industrial policy (EC, 2023a,b,c) should not only be understood as a response to the IRA, but also as an attempt to resolve this internal contradiction afflicting the EU funding system in the field of climate and economic policy. The European Commission's proposals regarding

5 For example, this aspect of the IRA is not mentioned at all in BDI (2023) or (Bruegel, 2023), even though these studies provide an otherwise detailed analysis of the IRA.

6 The EU's funding programmes for structurally weak regions and SMEs counteract this trend.

7 The German Federal Ministry for Economic Affairs and Climate Action represents the Federal Republic of Germany in most state aid proceedings before the European Commission.

a Green Deal industrial policy will be explored in more detail in Chapter 5.

Thirdly, the IRA mainly supports the production of climate-friendly goods, while the EU programmes are geared towards promoting climate-friendly investments in research and development. The U.S. approach helps stimulate a scaling up of production, which is often pivotal to the economic leveraging of innovation in nascent industries. However, a consistent use of investment subsidies (capex) for all goods along the value chain can provide a similar economic impuls as production subsidies (opex) since large-volume production of new goods requires large-volume investments in plant and equipment. From an economic vantage point, one superior aspect of the investment-based approach is that it directly stimulates expansion of production capacities, thus bolstering potential output (long-run economic growth).

Fourthly, while good jobs and workers' rights serve as a cornerstone of EU labour market policy, these principles are not part of any investment-based program. In other words, climate policy and economic policy are usually discussed separately from labour market policy. The Biden Administration, on the other hand, has with the IRA explicitly wedded industrial policy with fair wages for workers. This approach to industrial policy, respectively climate policy, is promising and should also be a guiding principle when designing a European IRA.

## 2.3 COMPARISON OF THE TWO APPROACHES

Table 2 provides a simplified comparison of the economic principles underlying the IRA and EU climate policy, respectively the EU state aid rules. The figure is a streamlined depiction of the main contrasts between the support programmes, as also employed in the description of IRA and EU policy in sections 2.1 and 2.2. As discussed in these sections, EU climate and economic policies have evolved considerably over recent years, so that these differences are often less marked in actual economic policy practice. However, the sum total of the EU exceptions and special rules still do not yield a coherent policy framework.

The differences in the two policy approaches examined can be attributed to fundamental differences in the economic theories involved. In order to better understand these theoretical differences, the next two chapters analyse the economic basis of European economic and climate policy (Chapter 3) and the U.S. IRA (Chapter 4) in more detail.

### Table 2. Comparison of funding principles

| U.S. policy (IRA) | EU policy (state aid rules) |
|---|---|
| Support climate-friendly investment or production through subsidies | Penalise climate-damaging investment or production using carbon pricing |
| Targeted support for key economic sectors/products – the state has a plan | General support for research and development – the state does not need a plan |
| Implementation through unbureaucratic tax credits | Implementation through bureaucratic project evaluation (micro-management without macro plan) |
| Investment/production subsidies are linked to good-jobs conditions | Innovation/investment policy and labour market policy are separated |

# 3
# EU CLIMATE POLICY: THE MARKET-LIBERAL DREAM

The principles underpinning the European Union's economic and climate policy, which also provide the theoretical framework for the EU state aid rules, were spelled out in the 1990s. These principles are derived from a market-liberal view of the economy and society, which has shaped public debates on economic policy issues since the 1980s. Of course, this debate – just like the EU's economic and climate policies – has evolved in recent years. Nonetheless, the spirit of the market-liberal theory reverberates between the lines in almost every public debate on EU policy. In particular, market-liberal voices have made themselves heard in large numbers in the ongoing debate over possible European responses to the IRA.[8] In order to classify and evaluate these and other proposals, this chapter outlines the key elements of the market-liberal approach to climate/transformation policy.

## 3.1 MARKET-LIBERAL THEORY

The market-liberal approach has its roots in economic liberalism and two economic ideas closely linked to economic liberalism. First, a notion of freedom that derives from the liberal economic tradition, eloquently described by Friedrich Hayek in "The Constitution of Liberty" (1960). At the heart of it is a free market economy in which individuals and business enterprises compete to produce the best ideas, thereby generating economic prosperity for all. Applied to climate or transformation policy, this market-liberal economic approach means a focus on climate-friendly innovations developed and sold by profit-oriented companies.

The second idea is based on the insight that one's own freedom is limited by the freedom of others. From a liberal perspective, state intervention in the market economy is usually justified in the presence of so-called externalities: Consumption and production decisions made by individual actors have a direct and significant effect on the well-being of other actors. In such a situation, even behaviour that is rational from an individual point of view will often not help achieve an objective that is desirable for society as a whole, and it is the state's task to ensure macroeconomic efficiency through targeted intervention in the market.

Specifically, the first and most important principle of the market-liberal theory is trust in the market mechanism to allocate scarce resources efficiently using price signals as a powerful coordination device. Beyond this love affair with markets as an almost infallible coordination mechanism, two externalities have shaped the climate policy debate. In line with two externalities, EU climate policy has focused attention on two key policy instruments:

— Correcting the negative climate externality: A uniform and sufficiently high carbon price so that market prices will adequately reflect the climate costs of different types of behaviour.[9]

— Correcting the positive knowledge externality: Broad-based support of research activities to provide companies with sufficient incentives to develop new, climate-friendly technologies.

Both policy measures are in principle reasonable. A carbon price is a targeted instrument to penalise climate-damaging behaviour and to correct for the negative climate externality. This climate externality is well documented by empirical work and explains the central function of carbon pricing in the climate policy debate.[10] Further, in the pure theory of market liberalism the carbon price should be uniformly applied to all sectors and branches of the economy. The economic logic of carbon pricing as the central instrument of climate policy is succinctly summarised in the first paragraph of an open letter published in the Wall Street Journal in January 2019 by 3,000 economists – including 28 Nobel laureates and 15 former chairpersons of the U.S. Council of Advisers:[11]

*"A carbon tax offers the most cost-effective lever to reduce carbon emissions at the scale and speed that is necessary. By correcting a well-known market failure, a carbon tax will send a powerful price signal that harnesses the invisible hand of the marketplace to steer economic actors towards a low-carbon future."* (Economists' Statement, 2019)

8 See, for example, Bruegel (2023) and Fratzscher, Wambach and Wolff (2023) for European responses to the IRA that are in line with the EU's market-liberal core principles.

9 There are two ways of implementing carbon pricing: Either through a carbon tax (so-called Pigouvian taxes) or via the trading of carbon permits. These two approaches can yield different outcomes, but for the analysis conducted in this paper these differences are not of first-order importance. The idea that the government should not use a tax, but create a market to tackle an externality problem goes back to the contribution by Ronald Coase (1960)

10 The carbon pricing logic is also central to the well-known DICE model (Dynamic Integrated Climate Economy model) first proposed and developed by William Nordhaus. See Barrage and Nordhaus (2023) for a survey of the literature and some recent results.

11 See also Greenstone and Nath (2021) for a concise statement of the centrality of carbon pricing in the market-liberal paradigm.

Public research funding makes economic sense because private enterprises do not fully take into account the positive externalities of their research activities. Hence, without funding they will tend to conduct less research than would be desirable from the perspective of society as a whole. The positive spillover effects of knowledge production (so-called knowledge externalities) are theoretically well-founded and broadly supported by empirical evidence (Bloom et al., 2019). From the market-liberal perspective, it is also important that public support does not favour any particular technology – public support has to be technology-open. In other words, public promotion of specific technologies presupposes knowledge on the part of the state that no single actor can possess in the view of market-liberals. In principle, such technology-openness pushed to the extreme would preclude support programs for technologies such as electrolysis processes for the production of green hydrogen.

The market-liberal view of society is based on the notion that in a market economy with a properly functioning price system that correct for externalities (see above), decisions made by millions of individual firms and households will produce an optimal (Pareto-efficient) outcome. In this case, the price system operates as a perfect coordination mechanism that is often equated to the invisible hand of a demi-god. The invisible-hand analogy is usually associated with the work of Adam Smith and is known in Economics as the First Welfare Theorem. In its modern variant, this theorem was developed and analysed by the economists Kenneth Arrow and Gerard Debreu (and Lionel McKenzie) in the 1960s.[12] Krebs (2023) provides an additional discussion of the assumptions and models that are used to justify the claim that carbon pricing in combination with technology-neutral subsidies for research and development lead to a market outcome that is in a certain sense “best” for society (Pareto efficient).

## 3.2 MARKET-LIBERAL SOCIAL POLICY

Market-liberal theory as embodied in the Invisible Hand Theorem posits that a market economy is efficient in macroeconomic terms, but makes no general statement regarding distribution. In other words, even if the market-liberal approach to climate policy should lead to sustainable economic growth, the theory remains silent regarding the question of who gets how much. This begs the question how policy can ensure that as many people as possible can benefit a possible economic boom. Market-liberals have two answers to this question, neither of which is particularly convincing.

The first answer is based on a simple, yet radical notion: trickle-down economics. For example, this theory would claim that corporate profits and job-creation in a booming hydrogen sector automatically generate positive effects on wages and income in all sectors of the economy. Ultimately, so goes the argument, there are only winners, because the invisible hand of the market magically reconciles climate goals with economic prosperity and social justice. Trickle-down economics always stood on shaky theoretical grounds and has been refuted sufficiently often by the empirical evidence. It is high time to put this theory to rest.

The second answer is based on an apparently progressive idea, but a more detailed analysis reveals that in the end it is a subtle form of the trickle-down hypothesis. In contrast to the simple version, it rests on a sound theoretical foundation and it is the standard economic approach to social policy. This approach reduces the social question to redistribution by means of a progressive tax system and the welfare state. In other words, this approach claims that we can ensure a just transition to a climate-neutral economy by compensating the so-called “losers” of the transformation process using transfer payments.

The transfer-payment approach to addressing the social dimension of climate policy seems reasonable at first sight. However, there are at least three interrelated reasons why this approach will not deliver on its promise of a just transition to a climate-neutral economy.

Firstly, it is just a terrible way of looking at people and society. Nobody wants to be called a loser, and most people do not want to receive hand-outs from the government. In general, most people want decent jobs with good pay. More precisely, the transfer approach to the social dimension of climate policy overlooks the fact that in a market economy unemployment or low earned income is often associated with low social status – wages measure the "value" of work. Simply put, such "identity aspects" are at the core of philosopher Michael Sandel's thesis (2020) that social policy resting solely on an ex-post redistribution strategy cannot be considered an appropriate political strategy to manage globalisation and structural change. From this perspective, it is also understandable that a political party like the SPD seized on the notion of "respect" in general and minimum wages in particular as their core political message in the last federal election in 2021.

Secondly, the ex-post redistribution of income by the state always goes hand in hand with the risk that negative incentive effects will lead to a conflict between economic growth (efficiency) and social justice (distribution). Politically, this often means narrowing the debate to an imaginary distribution struggle between the "middle class" (from whom something is supposedly being taken away) and the "lower classes" (to whom something is being given). Or it sparks a counterproductive discussion about the amount of transfer payments for so-called "losers" of globalisation or the future climate transformation.

12 See Mas-Colell et al. (1995) for a standard textbook treatment of the welfare theorems. Neither Kenneth Arrow nor Gerard Debreu can be considered an advocate of market-liberal policies. Indeed, Kenneth Arrow was quite critical of the view that real market economies would generate efficient outcomes (Arrow, 1978).

Finally, distribution determines economic prosperity. A comprehensive approach to social justice and economic prosperity should therefore start with an analysis of the production process and the fair distribution of market incomes. Put differently, the common idea that we can first ask the question "how do we increase the size of the cake?", and then ask the follow-up question "how do we distribute the cake?", is fundamentally flawed. Instead, we should focus on one question before everything else: "How do we ensure that everybody gets a fair chance at baking the cake?".

These considerations do not mean that social security and redistribution are bad. A comprehensive social agenda will always imply an adequate social security system. However, one should always bear in mind that the question of social justice cannot be reduced to the design of the welfare state. A one-sided focus on ex-post redistributions will never achieve social justice. Unfortunately, such a narrow-minded approach to the social dimension of climate policy is quite typical in many political circles that use the market-liberal paradigm as their theoretical foundation.

# 4 MODERN CLIMATE POLICY: THE SOCIAL REALITY

This chapter discusses the fundamental problems of the market-liberal approach to climate policy, respectively the challenge of transforming the economy. The chapter also outlines the main elements of modern climate (transformation) policy. The market-liberal approach to climate policy is based on a theory of the economy and society that is far removed from reality, and it is therefore doomed to fail. In contrast, the modern approach to climate policy is based on a more realistic theory of society that can in principle achieve all three goals: climate neutrality, economic prosperity, and social justice. Modern industrial policy is a central pillar of modern climate policy. The IRA can be seen as an attempt by the Biden Administration to implement modern industrial policy with a strong pro-worker bent.

## 4.1 PROBLEMS AFFLICTING THE MARKET-LIBERAL APPROACH

The traditional discussion of climate policy is deeply rooted in the market-liberal paradigm. This is highly problematic because market-liberal theory leaves out important features of the economy and society. Thus, the traditional approach to climate policy is based on a faulty theory that leads to wrong policy recommendations. Specifically, if governments were to follow the advice of market-liberal economists and focus on carbon pricing, then they would have to set a very high carbon price to reach their climate targets. This crude policy approach would inevitably lead to the loss of well-paid jobs and a decline in prosperity.[13] Market-liberal climate policy therefore creates a conflict between climate protection and economic prosperity, and climate protection and social justice. Thus, it will fail in reality and force policy-makers to change course ultimately.

The shortcomings of the market-liberal approach to climate policy can be traced back to two underlying assumptions. In other words, market-liberal theory disregards two structural aspects of existing societies that play a particularly important role in transformation processes like climate transformation.

The first element missing is adjustment costs (frictions) that are often combined with large degrees of uncertainty about the future. People and business enterprises need time to adapt and adjust their behaviour to a new, climate-neutral world. Moreover, the transition to climate-neutral production is associated with considerable costs in the form of investment, including costs to reassign and retrain the workforce. Such adjustment costs are the central argument in Polanyi's (1944) work on the Great Transformation. In particular, Polanyi criticises the theory of market-liberal economists as being too far removed from reality because it first creates the fictitious commodities of "labour" (people) and "land" (nature), and then assumes – in the face of empirical evidence to the contrary – that these fictitious commodities operate in a market economy detached from the social context.

13 Note that the incentive effect of carbon pricing is well supported by the empirical evidence in many areas (German Council of Economic Experts, 2019), but there is little empirical evidence that supports the view that carbon pricing encourages investment in climate-friendly technologies (Lilliestam et al., 2021). Of course, this lack of evidence is a major problem for the carbon-pricing approach to climate policy since these types of investments are supposed to be the main driver of a successful climate transformation.

Market-liberal theory becomes a radical market theory that analyses and interprets social processes solely from the market perspective.[14] The modern economics literature has formalized such adjustment costs in the labour market within the context of the search-and-matching framework,[15] but this type of analysis has so far not been incorporated into the design of climate policy.

The second element missing in the market-liberal theory is power. In the labour market, power structures determine the distribution of the surplus value generated by existing employment relationships between labour (the employee side) and capital (the employer side). This distribution affects the efficiency of production and economic growth. The relationship between power, distribution and economic growth was addressed by an extensive neo-Marxist literature in the 1970s (Marglin, 1984). Viewed from a historical perspective, it has served as a major driver of the Social Democratic movement. Modern labour market research has rediscovered the significance of power factors in the context of empirical evidence on minimum wages (Manning, 2021), which clearly refutes the market-liberal theory of the labour market (Krebs and Drechsel-Grau, 2021).

Beyond adjustment costs and market power, there are additional arguments that can provide a rationale for a climate policy that does not confine attention to uniform carbon pricing and technology-open support for research and development. Acemoglu et al. (2012) argue that path dependence in the accumulation of knowledge implies that climate policy should steer technological progress in a particular direction. This can be accomplished, for example, by subsidising only the development of climate-neutral (net zero) technologies. Acemoglu et al. (2016) shows that the socially optimal carbon price might be substantially lower in a world in which such path dependence is present, and that the optimal subsidy for the development of net-zero technologies can be large.

The standard economic rationale for industrial policy are economies of scale and agglomeration effects (Rodrik, 2004). In this case, the unit cost of production decreases with the scale of production, but individual actors do not fully internalise the economy-wide scale effect. For example, one would expect such scale effects in the production of solar panels and electric batteries (Beirat-BMWK, 2022). Clearly, in reality it often happens that adjustment costs, uncertainty, path dependence, and economies of scale coexist, providing various complementary arguments in favour of modern industrial policy.

The literature on strategic trade policy (Brandner, 1995) provides an additional rationale for the support of domestic industries. Specifically, strategic trade policy assumes that the fundamental market failure is that there is imperfect competition among firms (oligopoly). From this point of view, Germany or Europe must come up with a response to Chinese and American industrial policy in order not to fall behind in global competition. Note, however, that this line of argument usually implies that strategic trade policy (responding in kind to a threat) is only a second-best policy and is bad for the global economy, even though it is rational for each individual country to pursue such a strategy. See Krebs (2023) for additional analysis.

## 4.2 MODERN CLIMATE POLICY

Modern climate (transformation) policy is based on a realistic theory of the economy and society that explicitly takes into account adjustment costs and power. The modern approach does not make the punishment of climate-damaging behaviour the centrepiece of its policy framework, but instead encourages and supports people and business enterprises to behave in a climate-friendly way and to switch to climate-friendly technologies. It resolves the apparent conflict between climate protection, prosperity and social justice by reducing adjustments costs using targeted support measures and establishing fair conditions in the labour market.

Modern climate policy emphasises two policy instruments that play only a minor role in the market-liberal paradigm (Krebs, 2021a, 2023): Modern industrial policy and public infrastructure policy. In other words, modern climate policy widens the policy space and moves from a one-dimensional policy problem, in which carbon pricing is the central policy instrument, to a multi-dimensional policy problem, in which carbon pricing is at best one of several central instruments in a comprehensive policy framework. The modern approach is socially optimal in a complex reality that substantially deviates from the market-liberal dream world. In economic terms, modern climate policy is justified because of several market failures. Section 4.1 provides a brief discussion of the types of market failures that can rationalize modern industrial policy: Adjustment costs/frictions, power, economies of scale, and agglomeration effects. Krebs (2021b) discusses in more detail the market-failure approach to public-infrastructure policy broadly defined (including housing and education).

The successful implementation of modern climate policy requires a modern state whose actions are guided by two economic policy principles. Firstly, the modern state plays a pivotal role in building up the infrastructure that underpins a climate-neutral economy. For example,

**14** Polanyi's theory of economy and society also posits that the pressure caused by radical market reforms and progressive commodification (globalisation) will lead to a counter-movement in society. The election of Donald Trump and Brexit are two events that can be interpreted as the result of such counter-movements.

**15** See, for example, Cahuc and Zylberberg (2004) for good textbook treatment of the search-and-matching model of the labour market that was developed by the economists Peter Diamond, Dale Mortensen, and Christopher Pissarides.

the development of a competitive hydrogen economy in Germany and Europe requires the construction of a network of hydrogen pipelines in addition to the expansion of renewable energies. As a second example, the public sector needs to invest in the rail network so that people and companies can use climate-friendly means of transportation. This type of infrastructure policy is a fundamental task of the modern state that should not be privatised.

Secondly, the modern state needs to implement a modern version of industrial policy that focuses on supporting private investment in climate-neutral technologies and the build-up of climate-neutral production capacities. Put differently, while the market-liberal view assumes that the state needs no plan, the modern approach to climate policy rests on the idea of an active state with a coherent plan. Mazzucato (2020) is representative of a recent development in economics that genuinely addresses the planning tasks of a modern state. The following section outlines the main features of these ideas applied to the question of industrial policy.

## 4.3 MODERN INDUSTRIAL POLICY

Modern industrial policy stimulates private investment in climate-neutral technologies through direct grants, tax breaks or tax credits, low-interest loans or equity participation schemes. It can either promote climate-neutral production, as is mainly the case with the IRA, or it can focus on the promotion of climate-neutral investment, as is the case with depreciation allowances or direct grants for climate-neutral investments as currently planned by the German government ("super write-offs"). Moreover, modern industrial policy is always a good-jobs policy. This means, among other things, that any investment subsidy scheme should be linked to good-work conditions. For example, companies can receive an extra bonus if they pay decent wages, as is the case with the IRA.

Modern industrial policy is in general both horizontal and vertical policy. Vertical industrial policy stimulates the expansion of domestic production capacities for a range of strategically important products such as electric batteries, solar panels or wind turbines. Such a policy usually requires in-depth knowledge of relevant value chains and complex rules governing the funding scheme.[16] Horizontal industrial policy supports and promotes any type of private investment in climate-friendly technologies regardless of the economic sector. In principle, horizontal industrial policy can be implemented with relatively simple support rules and is in this sense SME-friendly. In contrast to vertical industrial policy, however, it is less suited to the development of key industries in the domestic economy.[17]

The successful transformation of the economy requires not only investment in new technologies, plant and equipment (investment in tangible objects), but also additional investment in the workforce (investment in human capital). Modern industrial policy therefore seeks to expand on-the job training and apprenticeship programmes. This can be achieved by increasing the subsidies for vocational education and on-the-job training, and by hiring additional teaching staff.

Finally, modern industrial policy must guarantee competitive energy prices. Specifically, long-run energy prices paid by users should be in line with average costs of energy production and short-run price volatility should not be excessive. For many manufacturing companies, energy is an essential input in production and a main determinant of production costs. Thus, industrial policy can only be effective in boosting climate-neutral investment and production if domestic producers can count on stable and competitive energy prices. To achieve this objective, the government has to adopt policies that boost the long-run supply of renewable energy, expand the transportation infrastructure for electricity and hydrogen, and regulate the energy market efficiently.[18]

Modern industrial policy differs from traditional industrial policy not only in its strong focus on climate-neutrality and good jobs, but also in terms of its instruments. Traditional industrial policy was often conducted with the aim of creating "national champions", that is, large domestic corporations that could compete internationally. Furthermore, modern industrial policy does not include protective tariffs that prevent other countries from flourishing. Instead, modern industrial policy welcomes trade among countries, but acknowledges the fact that individual companies and people need support in a monumental transformation process. In this sense, modern industrial policy is the opposite of protectionism. It will increase worldwide prosperity as long as all countries adhere to it.

## 4.4 WHY PRO-WORKER POLICY

In the preceding section, it was argued that modern industrial policy is always a good-jobs policy, and that a good-jobs focus would require the government to take steps to secure good-pay conditions. This begs the question why it is necessary for the government to intervene in the labour market to boost wages. Would it not be enough for economic policy to lay the foundation

16 The development of key industries is often justified in geopolitical terms, but also makes sense economically when there are economies of scale or agglomeration effects – see subsection 4.2. Dullien and Hackenbroich (2022) discuss vertical industrial policy in the context of the European response to the IRA.

17 The papers by Beirat-BMWK (2022) and Fuest (2023) can be viewed as cautious pleas for some version of horizontal industrial policy.

18 In addition, public procurement policy that uses climate or good-pay criteria is a powerful tool to implement modern industrial policy.

for a high-productivity, industrial sector that will automatically pay good wages?

Market-liberal theory has a simple answer to this question: Wages always correspond to the marginal product of labour, and productivity growth therefore automatically translates into rising wages. This is a nice and simple answer to a complicated question, but it is also wrong. The experience of the last 30 years in the many advanced economies, in which steady productivity growth coexisted with flat wages for the majority of workers, has put a big dent into this simplistic theory. Further, the empirical evidence on the missing unemployment effect of minimum wages clearly refutes the marginal-product theory of wages in the low-wage segment of the labour market (Krebs and Drechsel-Grau, 2021).

The second drawback of the market-liberal answer to the above question is that it is not in line with modern labour market research. In particular, a large part of modern labour market theory is built upon a search-and-matching framework that deviates from the simple marginal-product theory of wages. Specifically, existing employment relationships are viewed as a successful match between a worker and a firm that creates surplus value, and the division of this surplus value depends on the bargaining power of the individual parties. If capital owners possess all the bargaining power, then the wage is equal to a minimum level necessary for subsistence and all the surplus goes to the capital side. If workers (unions) possess all the bargaining power, then the wage is equal to the marginal (revenue) product of labor and all the surplus goes to workers. Neither arrangement is efficient. Indeed, production efficiency is only achieved if there is an appropriate balance between capital and labor, and the surplus value is distributed fairly. [19] Thus, the market-liberal theory is a special, empirically rejected case of a more general theory of the labour market.

Indeed, there is by now plenty of evidence that worker power has been declining since the 1980s (Stansbury and Summers, 2020), and that weakening of worker power has reached inefficiently low levels (Krebs and Drechsel-Grau, 2021). Of course, all this is not surprising given that union busting and other attempts of preventing labour to organise started in the 1980s with Ronald Reagan in the U.S. and Margaret Thatcher in the U.K. In such a situation, a good-pay policy of the government is not only good for workers, but also good for economic growth and prosperity (Acemoglu, 2001). This, in a nutshell, is the economic argument in favour of the pro-worker agenda of the Biden Administration that explicitly links investment subsidies with good-pay conditions. Of course, such a policy approach might not work in a country like the U.S. that has weak labour market institutions and lacks labour organisations. Specifically, to implement such a good-pay policy is quite difficult without a clear reference wage in the various sectors, which is already made evident in the vague wording "prevailing wages" in the IRA. Germany and Europe should exploit their institutional strength offered by social partnership and collective bargaining to implement an improved version of the pro-worker industrial policy of the Biden Administration.

19 Cahuc and Zylberberg (2004) contains a discussion of the efficiency condition that is known in the literature as the Hosios condition.

# 5
# A EUROPEAN IRA

Chapters 3 and 4 provide a general economic analysis that is used in this chapter to derive the outline of a German and European version of the IRA. In addition, this chapter also relates the suggested policy measures to the proposals made by the European Commission contained in the Net Zero Industry Act (EC, 2023a), the Critical Raw Materials Act (EC, 2023b), the reform of the EU electricity market design (EC, 2023c), and the recent update of the Temporary Crisis and Transition Framework (EC, 2023d).[20]

## 5.1 EUROPEAN UNION

The analysis contained in chapters 3 and 4 has shown that the climate and economic policy approach adopted in the IRA is basically the right one, but it also exhibits weaknesses. In particular, the US lacks the labour market institutions to implement a good-pay programme, and Germans and Europeans should leverage their institutional strengths to implement their own, improved version of the IRA. In addition, the local content requirements ("Buy American") have a protectionist ring to them and cause a lot of red tape in an otherwise unbureaucratic programme. At the European level, the following policy measures ought to be part of a European response to the IRA:

— **European projects:** Expand the support for strategically important projects in the area of climate transformation while at the same time simplifying the funding process.

— **State aid rules:** Make EU state aid rules more flexible with regard to national programmes to facilitate simple and SME-friendly support for private investment in renewable energy sources and the decarbonisation of industry.

— **Good jobs:** Strengthening of European initiatives in the field of education and training as well as providing guidelines for policies that combine investment subsidies with good-work (good-pay) conditions.

— **Electricity prices:** Reform the European electricity market to ensure competitive electricity prices in the EU.

— **Financing:** Create additional funding opportunities so that all EU Member States can implement a modern industrial policy.

— **Trade:** Conclude additional industrial trade agreements with North America and other regions; avoid "buy Europe" policies (local content rules) and other forms of protectionism; provide additional EU funding to countries in the Global South so they can develop their own version of modern industrial policy.

**European projects (vertical industrial policy):** The expansion of European production capacities for strategically important net-zero products has already become a key component of EU funding policy over the last years. Specifically, within the framework of Important Projects of Common European Interest (IPCEI), two programmes to jump-start European production of battery cells and one programme to stimulate European production and use of climate-neutral hydrogen have been implemented to date.[21] The IPCEI programme should be expanded to cover other clean-tech products or sectors such as wind power and solar power facilities. At the same time, the funding process should be streamlined to enable fast-track funding while avoiding red tape. This can moreover be buttressed with an expansion of the initiative or action plan to strengthen European procurement of critical raw materials in order to reduce dependence on imports of raw materials.

The ideas outlined here are in line with the recent proposals of the European Commission on the renewal of European industrial policy as laid out in the Net Zero Industry Act (EC, 2023a) and the Critical Raw Materials Act (EC, 2023b). In addition, the proposed regulatory improvements (e.g. time limits for permits) can speed up the application process. In other words, the European Commission has put forward a comprehensive framework for conducting project-based, vertical industrial policy that constitutes one central component of modern industrial policy.

**State aid rules (horizontal industrial policy):** The European Commission aims at rendering the state aid framework for national support programmes more flexible in order to enable simple, uniform support for private investment in renewable energies and decarbonisation

20 Preceding the publications of these proposals in March 2023, the European Commission published in early February 2023 "A Green Deal Industrial Plan for the Net-Zero Age" (EC, 2023e). According to the European Commission, the first three proposals (Net Zero Industry Act, Critical Raw Materials Act, Reform of the EU electricity market design) constitute the new framework for the Green Deal industrial policy of the EU.

21 Apart from the promotion of renewable energies, the IPCEI programme and the EUInvest programmes are currently the only EU programmes that directly promote investment in climate-neutral technologies by private actors. The EUInvest programme provides low-interest loans, but no grants or tax relief

of industry (EC, 2023e). This move is to be welcomed, as it can simplify implementation of horizontal industrial policy at the national level. In making state aid rules more flexible, the EU would be taking an important step towards supporting an approach to industrial policy that does not define state aid in terms of strategic goods or sectors, but instead provides investment subsidies according to uniform criteria relating to the reduction of emissions through respective investments. Such an industrial policy holds out the advantage that it can, in principle, be implemented with relatively simple state aid rules and in this sense is SME-friendly.[22] Making EU state aid rules more flexible in this direction would also be in line with the "super write-offs" currently planned by the German government, which is meant to encourage private investment in climate-friendly and digital economic goods.

The European Commission has used the recent update of the Temporary Crisis and Transition Framework to integrate some of these aspects by providing a long list of products, respectively investments, for which exemptions to the state-aid rules are allowed (EC, 2023d). The exemptions apply to policy schemes set up until 31 December 2025. This is a useful update of the Temporary Crisis and Transition Framework that allows EU member states to more easily conduct some form of horizontal industrial policy. However, the proposal does not go far enough since it still uses the approach of treating industrial policy as a temporary exemption to the market-liberal rule. It would be preferable to put modern industrial policy on a more solid and permanent footing in the EU by revising the General Block Exemption Regulation and giving a general block exemption to a comprehensive list of net-zero investments. The list of included types of investments could be taken from the list recently proposed as an update of the Temporary Crisis and Transition Framework (EC, 2023d), which is quite comprehensive. In this respect, the recent update to the General Block Exemption Regulation (EC, 2023f) is not sufficient since it only includes minor improvements that fall short of a comprehensive redesign of EU industrial policy.

**Good jobs:** A modern industrial policy is always a good-jobs policy as well. It is therefore a positive development that the European Commission explicitly mentions the strengthening of education and training in its Net Zero Industry Act (EC, 2023a). However, the proposal of the European Commission lacks a central part of a good-jobs industrial policy: Linking the investment subsidy to good-pay, respectively good-work, conditions. Even if the EU will not directly require such conditions for the EU funding of European investment projects, it could draft appropriate guidelines for national funding programmes, as it has previously done for public procurement. Good-pay conditions can be implemented relatively easily in most EU member states by using union wages, respectively collectively bargained wages, as benchmark wages. In contrast to the U.S., most EU countries have a realistic chance of successfully implementing such a good-job industrial policy due to their relative institutional strengths (collective bargaining, union coverage, social partnership).

**Electricity prices:** Electricity costs are a major expense item for many manufacturing companies, particular in energy-intensive industries. The transition to climate neutrality of production will only reinforce the importance of electricity prices – in the long run, renewable electricity in conjunction with renewable hydrogen are the only energy input factors into the production process. Competitive electricity prices are therefore a precondition for a successful transformation of industry and should be a central component in any version of a modern industrial policy. Competitive electricity prices are not only necessary for European companies to be able to compete on a level playing field in world markets, but also make sense from a climate policy perspective: Predictable and low electricity prices provide a strong incentive to invest in production processes that mainly use renewable energy as energy input (electrification of industrial production=.

Long-run prices in electricity markets will only be in line with competitive electricity prices for users if three conditions are satisfied. Firstly, the long-run supply of renewable electricity has to increase substantially through a massive expansion in investment in solar and wind energy. Secondly, the transportation structure for electricity (electric grid) needs to be modernised. Finally, the efficiency of electricity markets needs to be improved through reform of the market design. The European Commission has put forward several proposals regarding such reforms of the EU electricity market (EC, 2023c), and some member states like Spain and France have presented their own ideas. In contrast, constructive proposals from the German government, respectively the German Federal Ministry for Economic Affairs and Climate Action, that go beyond a defence of the status quo are missing so far.

**Financing:** From an economic perspective, it is crucial to ensure that all EU member states have the financial resources to implement a modern industrial policy. Only if this is the case will this policy be an optimal economic policy. The European Commission has proposed the establishment of a European sovereignty fund (EC, 2023) in which to pool financing for Green Deal industrial policy and provide additional financial resources. Other financing instruments are conceivable. Ultimately, the important point is that a common European industrial policy will only be successful if funding can be guaranteed for all EU member states.

**Trade:** Modern industrial policy affirms and encourages international trade and opposes protectionism. The EU should therefore step up efforts to conclude industrial

22 Preparing a taxonomy along these lines is of course anything but easy.

trade agreements with North America and other regions. "Buy European" or local content requirements, on the other hand, are to be avoided. Furthermore, the EU should muster additional funds for financially distressed countries in the Global South in order to enable these countries to implement a climate-neutral industrial policy. This step is necessary because a modern industrial policy can only benefit the global economy if all countries have the possibility to implement such a policy.

## 5.2 GERMANY

The European response to the IRA must be coordinated at EU level, but member states can contribute to the success of a European industrial policy through national measures. Together with the aforementioned measures to be taken at European level and a corresponding infrastructure policy (Krebs, 2022), this would produce a policy package that can lay the foundations for a socially just climate transformation of the economy. In particular, the German government could promote a modern version of industrial policy in Germany by instituting the following measures:

— **Climate-neutral investments:** Speedy enactment of tax incentives for climate-neutral investments as laid down in the Coalition Agreement of the current German government ("super write-offs").

— **Good Jobs:** Combine investment subsidies with good-work (good-pay) conditions – additional subsidies for companies that pay union wages; speedy implementation of the planned Federal Collective Bargaining Act (*Bundestariftreuegesetz*); increase subsidies for on-the-job training and apprenticeship programs.

— **Electricity prices:** Support the European efforts to reform electricity markets and immediately introduce a program that ensures competitive electricity prices for industrial users.

— **Financing:** The funding of measures to conduct modern industrial policy in Germany needs to be secured in line with the constitutionally enshrined debt brake (balanced-budget rule).

**Climate-neutral investments:** In their Coalition Agreement, the three parties currently constituting the German government (social democratic party, green party, free democratic party) have provided for the introduction of so-called "super write-offs" (special depreciation allowances). This scheme is to offer tax incentives for companies that invest in energy efficiency and climate protection, but direct grants (investment premiums) are also in discussion.[23] One advantage of direct grants is that companies that are not profitable at present may also benefit from it. Tax reliefs or grants for climate-friendly investments (transformation investments) are part of modern industrial policy. If government support is provided according to uniform criteria linked to the reduction of emissions through the respective investments as planned, then this constitutes some form of horizontal industrial policy. The advantage of horizontal industrial policy is that it can, in principle, be implemented with relatively simple rules, which as a result makes it SME-friendly. National implementation of this measure should be in line with the planned EU extensions of state aid rules (see section 4.1).

**Good jobs:** The good-jobs component of German industrial policy can be reinforced by adopting the following three policy measures. Firstly, the planned super-write offs and other investment subsidies currently being designed (e.g. carbon contracts for difference) should be linked to good-pay conditions by incorporating an extra premium for companies that pay union wages, respectively wages that are an outcome of collective bargaining agreements (Tariflöhne). This step would align well with the corresponding prevailing-wage condition as provided for in the IRA.

Secondly, the planned Federal Collective Bargaining Act should be implemented swiftly (BMAS, 2022a). This means that federal public contracts should be awarded primarily to enterprises that pay union wages, respectively wages that are an outcome of collective bargaining agreements (Tariflöhne). In this respect, care should be taken that downstream companies and distributors are also covered, and that an appropriate sanction mechanism is in place. These two policy measures not only bring about higher wages, but they also strengthen the collective bargaining system, thus contributing to the promotion of collectively agreed wage-setting as set out in EU Directives in October 2022 (EU, 2022).

Finally, the government support for on-the-job training and qualification of employees should be improved by raising subsidy rates. In addition, the conditions governing access to these programmes could be eased, with the focus being placed on occupations where there is a shortage of labour and occupations undergoing structural change.[24] From an economic perspective, this third measure supports companies and people during the transformation

23 Under the Coalition Agreement, transformation-related investment includes all investments in economic goods or assets that contribute to ecological and digital transformation of the economy – i.e. climate-related investments and digitalisation-related investments. The digital component is somewhat more difficult to reconcile with EU state aid rules, which suggests focussing on climate-related investments (Handelsblatt, 2023).

24 State subsidies are disbursed for wages and training costs and are usually graded according to company size. See BMAS (2022b) for currently planned changes in funding conditions.

process by boosting investment in human capital and reducing the adjustment costs for labour as a factor of production.

**Electricity prices:** The national gas and electricity price ceiling for industrial customers currently caps gas prices at 7 cents per kilowatt hour and electricity prices at 13 cents per kilowatt hour for a basic quota that depends on past consumption by the respective company (Bundestag, 2022a, 2022b). A similar approach can be used to ensure competitive and predictable electricity prices for industrial consumers in Germany on a more durable basis, though the electricity price needs to be substantially lower than 13 cents per kilowatt hour for German industry to be competitive. This is not only economically important, but also makes good sense in terms of climate policy, as competitive and stable electricity prices speed up the needed electrification of industrial production.

For the implementation of an industrial electricity price to be successful, current legislation must be modified in three directions. Firstly, the electricity price ceiling needs to be applicable until European reform of the electricity market is completed – at present, the German electricity ceiling is only to apply until 30 April 2024. Secondly, the basic quote for which the price ceiling applies should be defined in terms of current electricity consumption and not on past consumption. This is the only way to ensure that the electricity price ceiling promotes production and employment, instead of simply boosting company profits and dividend payments (Krebs, 2022). Thirdly, the ceiling for the total volume of low-price electricity an individual company can receive should be raised. This step requires a corresponding approval by the EU and perhaps a modification of EU state aid rules.

**Financing:** The so-called "super write-offs" have already been laid down as part of the Coalition Agreement, even if the corresponding revenue shortfalls for the public sector are not yet reflected in the current budget and finance plan of the Federal Ministry of Finance.[25] Good-jobs policy measures have no direct impact on the public budget, but an expansion of funding for education and training has an impact on the budget of the Federal Employment Agency. Modification and extension of the gas and electricity price ceiling beyond 30 April 2024 may create substantial financing needs, but sufficient financial resources are available in the Economic Stabilisation Fund (WSF). From an economic point of view, such an extension should also be seen as a crisis-fighting tool, as the impact of the energy crisis on energy prices is very likely to have an effect going forward beyond 30 April 2024. This economic consideration should also be included in the legal assessment of using funds in the WSF beyond 30 April 2024.

The U.S. foray in the area of climate policy presents Germany and Europe with an opportunity to successfully shape the upcoming transformation process by means of a modern industrial policy. The measures discussed here constitute key elements of such an industrial policy. Moreover, a cross-departmental plan for energy and industrial policy is needed, which the German government should develop together with its European partners in the coming months and communicate to all actors accordingly – plan beats no plan.

**25** Revenue estimates contained in the fiscal plan of the federal government usually do not take into account measures that have not yet been enacted by lawmakers.

# 6
# CONCLUSION

The results of this study can be summed up in a simple thesis: It is desirable for society as a whole for governments to subsidise climate-friendly investments and to create well-paying jobs. A blanket criticism of the IRA as "protectionism" or a "subsidy run" thus falls short of the mark because it is based on a flawed analysis of the economic and societal problem. This mistaken analysis has its origins in a market-liberal theory of the economy and society that is far removed from reality and whose market fundamentalism still forms the economic basis for EU policy.

While in principle the IRA is the right approach to climate policy, it also exhibits weaknesses – not every subsidy is a good subsidy. This study puts forward some proposals for an improved version of the IRA – a so-called European IRA. If adopted, it would offer Europe a unique opportunity to accelerate the climate transformation together with the U.S. and other partner countries. If this European IRA is combined with the other components that make up modern climate policy, then the EU would be in a good position to achieve climate neutrality before 2050 while at the same time increasing economic prosperity and strengthening social justice.

One problem that remains is that many countries in the Global South do not have the financial means to implement a modern industrial or climate policy. Europe and the U.S. therefore need to expand international cooperation and development programmes at the same time as they implement a modern industrial policy domestically. These obstacles are real and must be taken seriously, but they cannot be used as an argument against a modern industrial policy in Europe. In other words, "Don't let the perfect be the enemy of the good."

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The USA has returned to the fight against climate change with the Inflation Reduction Act (IRA). The European reaction to this recalibration of U.S. climate and economic policy has been mixed. This study by Tom Krebs examines the IRA from a climate and economic policy perspective and draws a positive conclusion. In addition, the study derives recommendations on how policy makers in Germany and Europe could respond to the IRA, breaking with the market liberal approach of currently practiced economic policy in the EU.

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