



The
Federal Government

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For a strong steel industry in Germany and Europe

The Steel Action Concept

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Executive Summary

It is of outstanding importance to have a steel industry in Germany which is strong, internationally competitive and climate-neutral on a long-term basis.

Since 2010, steel production in Germany has dropped by around 10% (approx. 4 million tonnes) from 43.8 million tonnes to 39.7 million tonnes.¹ The workforce has declined by around 4,000 to 86,000.² This has led to certain adjustment measures, with further measures planned or in preparation. A continuation and acceleration of this development could sooner or later endanger the survival of this important industrial sector.

The economic downturn caused by the coronavirus pandemic is adding to these difficulties. The industry has already cut back production and is making extensive use of short-time work arrangements to avoid lay-offs. In the medium term, the prospect of resuming pre-crisis levels of production, which heavily depends on the further economic development, seems unlikely. Rather, there are growing fears that global demand for steel will drop even more sharply than during the financial crisis of 2009. Moreover, the structural problems within the global steel sector seem only to be getting worse, with many steel-producing countries having maintained or even expanded production rather than adapting it to altered demand in response to the global economic downturn. These developments are also having an impact on companies' investment capacity, limiting the scope of urgently needed investments in the future.

The European Union and the Federal Republic of Germany should therefore take effective measures at national, European and international level and work together with the steel industry to set the course for lasting competitiveness in a way that is compatible with the long-term goal of achieving greenhouse gas neutrality across Germany and Europe. One important aim is that the climate and energy policies sup-

port the transformation of the industrial sector, particularly via internationally competitive prices for electricity, gas and hydrogen. The Federal Government considers only hydrogen that has been produced using renewable energy (green hydrogen) to be sustainable in the long term.

The implementation of measures in the EU's Green Deal, which is necessary for effective climate action, and the implementation of the climate action decisions taken by the Federal Government, are a crucial step towards a climate-neutral economy. These measures are to help improve the competitiveness of German and European industry and make the steel sector fit for the future. They need to be given shape in ways that stimulate efforts to reorient and transform the sector. Research, development and a pro-innovation policy and investment framework have a vital role to play in supporting the transformation of the steel industry towards future-proof, climate-friendly production processes.

Climate policy is to act as a driver of growth and innovation in Germany and Europe. The Federal Government supports the steel sector in targeted measures to implement climate policy in companies.

The Steel Action Concept, which has been drawn up by the Federal Government together with the steel industry, builds on the Industrial Strategy 2030, the Climate Action Plan 2050, the Climate Action Programme 2030 and the European Green Deal. It cites measures needed to achieve the aforementioned goals. In addition, some of the proposals aim to improve the competitiveness of energy-intensive industries in general and to promote related transformational projects. We want to show that free world trade, climate action and the continued existence of competitive energy-intensive industry can complement one another in meaningful ways.

1 German Steel Federation (WV Stahl), 2019.

2 German Steel Federation.

Creating a level playing field on the global steel market

1. Germany will call for more resolute efforts both in the EU and in similarly affected third countries to tackle market-distorting measures such as non-WTO-compliant subsidies or dumping prices as well as protectionist trade policies, particularly with a view to reducing related global overcapacities.

Implementation: cf. items 2 and 3.

2. To this end, the Federal Government supports the work of the Global Forum on Steel Excess Capacity (GFSEC) in order to attain the goals defined in the G20 process. The only way to keep exerting influence on the countries that are the chief contributors to the current overcapacities on the world market is via the G20.

Implementation: The Federal Government will support efforts to bring China, the world's largest steel producer, back to the table of the GFSEC. Should the GFSEC prove incapable of action for the foreseeable future, countries and regions which are particularly hard-hit by over-production must agree on an alternative joint approach without China.

3. In addition, the Federal Government will work to ensure a rigorous application of EU trade safeguards and to improve them where necessary.

Implementation: A review of the existing EU steel safeguard measures, as proposed by Germany, France and others, was initiated by virtue of a notice by the European Commission published in the Official Journal of the European Union on 14 February 2020. On 12 June, the Committee on Safeguards agreed on a number of adjustments that will enter into force on 1 July. The Federal Government will seek to ensure that the effects of these measures are monitored by the European

Commission and that further adjustments are made as needed. In order to address ongoing market distortions, the extension of measures which are coming to an end (expiry reviews) is supported to the extent that the actual and legal preconditions exist.

Avoiding carbon leakage

In the shape of carbon emissions trading, the EU – in contrast to many other countries – already deploys a market-based instrument to reduce greenhouse gas emissions. Until a level global playing field with all the key steel-making countries is also attained here, further effective measures will need to be taken to prevent the relocation of energy-intensive industries to countries with less stringent standards.

4. The free-of-charge allocation of emission allowances within the EU Emissions Trading System (EU ETS) is an effective instrument that should be continued as necessary in order to avert the risk of carbon leakage. Just like the Innovation Fund of the EU ETS, the free-of-charge allocation of allowances is to be designed in such a way that it creates incentives for technological innovation and supports the long-term transformation of industry.

Implementation: The Federal Government will call for the continuation of free-of-charge allocation in the context of a potential review of the EU ETS Directive in 2021.

5. In addition to free-of-charge allocation as compensation for direct carbon costs, it is also important to consider adequate options for offsetting carbon-related increases in electricity prices for industrial installations.

Implementation: The Federal Government will continue to advocate its position to the European Commission during the review of the ETS State Aid Guidelines for 2021–2030.

6. It is necessary to ascertain whether a border tax or alternative approaches can be designed in a legally robust manner in order to ensure the same degree of protection against carbon leakage. In view of the unresolved issues pertaining, among other things, to compatibility with WTO law, it is not possible today to predict whether a border adjustment tax will be able to replace the existing anti-carbon-leakage system in the long term and what kind of introductory and transitional periods the new system might require.

Implementation: The European Commission will present a proposal in 2021; it is currently undertaking an impact assessment; the Federal Government supports this process.

Working together to make progress on the transformation

Steel in Germany and in the European Union is already being produced in a lower-carbon and more climate-friendly manner than in many other countries around the world. With a view to the target of achieving greenhouse gas neutrality by 2050, we are resolved to act in a wise and measured manner as we bring the ongoing transformation of steel-making into what will ultimately be a climate-neutral and sustainable process to a successful conclusion. In so doing, we aspire to technological leadership in the field of innovative and climate-friendly production processes. This will require investments worth tens of billions of euros over the next two decades.³ They will only take place if all the stakeholders have a reliable basis on which to plan for the medium to long term. The Climate Action Programme 2030 is a first step towards the creation of this basis. If the transformation is to be successful, however, German steel companies need to start taking resolute action now to convert production to climate-neutral processes in a speedy and rigorous manner while taking into

account their international competitiveness, and they need to start preparing the needed investments. This should also involve considerations about forward-looking forms of training and skills development for employees. The Federal Government will develop and implement a comprehensive transformation concept.

7. We want to create lead markets for low-carbon technologies by setting incentives – and, if necessary, by drawing up rules – for steel processors to deploy steel which is produced on a low-carbon (and by 2050, definitely on a carbon-neutral, preferably carbon-free) basis and to make good use of the potential offered by the circular economy.

Implementation: At national and European level, the Federal Government is calling for consideration to be given to solutions for how markets can be stimulated for climate-neutral products and products of the circular economy in energy-intensive industrial sectors, e.g. via incentives to stimulate additional demand for more climate-friendly steel (e.g. inclusion of sustainability criteria in Federal Government procurement), and possibly regulated, e.g. via a quota for low-carbon (by 2050, carbon-neutral or, as far as possible, carbon-free) steel in finished products. Such measures would require a clear and ambitious label to mark out the more climate-friendly or sustainable intermediate and finished products in a way that is easy to understand.

8. The implementation of carbon contracts for difference is another way to set incentives for companies to invest in and operate green technology. A state guarantee of a carbon price for companies investing in climate change mitigation would increase the financial incentive to reduce carbon emissions. It would reduce the uncertainty surrounding the development of the carbon price

³ Calculation by the German Steel Federation: Multiplying the rule-of-thumb amount of €1000 for every tonne of new crude steel production capacity by a primary steel production volume of around 30 million tonnes has produced a rough estimate of the investment required for a complete switch of the primary steel route to low-carbon processes.

and make it easier for companies to plan their investment decisions. Moreover, it can add to the cost-effectiveness of such measures. By financing, in full or in part, the differential between the current carbon price and a contractually defined carbon price oriented to emissions avoidance costs, companies could be given the necessary security to invest in forward-looking technologies in line with the goal of greenhouse gas neutrality. Such guarantees can be granted on the basis of individual projects, on a demand basis, or by public tender to avoid over-funding. Over-funding is also prevented by securing the actual differential costs.

Implementation: Within the framework of the National Hydrogen Strategy, a pilot process for testing carbon contracts for difference was approved in order to facilitate the conversion to climate-friendly industrial processes in selected sectors (steel and chemical industries). In the context of the Climate Action Innovation Pact, it will be assessed in the course of 2020 in terms of its quality as an instrument for all basic materials industries. The implementation could take place, for example, within the framework of the *National Decarbonisation Programme* and the programmes *for hydrogen use in industrial production and for avoiding and using CO₂ in industries relying on basic materials*. Germany will seek close coordination with the European Commission with regard to the EU ETS reform planned by the Commission for 2021 and the planned revision of the State aid rules for the European Green Deal.

In addition to carbon contracts for difference, the introduction of moderate and gradually rising quotas for the production and use of climate-friendly basic materials may also be assessed.

9. We support the development of a market for hydrogen technologies. The Federal Government considers only hydrogen that has been produced using renewable energy (green hydrogen) to be

sustainable in the long term. It therefore seeks to use green hydrogen, promote its rapid market roll-out and establish the necessary value chains. Apart from that, it believes that both a global and a European hydrogen market will emerge in the coming ten years and that carbon-neutral (for example blue or turquoise) hydrogen will also be traded on this market. Given Germany's close integration in the European energy supply infrastructure, carbon-neutral hydrogen will also be relevant for Germany and, if available, will be used on a transitional basis.

Implementation: The National Hydrogen Strategy, which was adopted by the Cabinet on 10 June 2020, lays an important foundation for the market penetration of hydrogen technologies.

The Federal Government will start early to closely analyse and actively communicate the hydrogen needs of the steel sector in order to enable potential suppliers, consumers and investors to plan for the future. Since the steel sector – unlike transport or housing, for example – is entirely dependent on the availability of hydrogen for its decarbonisation, it will be examined how its hydrogen needs can be reliably met.

10. We want to achieve a situation in which the use of coking coal to make steel can gradually be shifted to hydrogen (cf. item 9). This requires that new steel production facilities are designed from the outset in a way that permits the use of both natural gas and hydrogen. This applies not only to “first of its kind” projects, but to the entire conversion process.

Implementation: The Federal Government has already launched a wide range of funding programmes, studies and projects. The current financial plan earmarks funding for the following items, among other things:

- A new budget item entitled *Use of Hydrogen in Industrial Production* worth €15 million for 2020 as well as commitment appropriations worth €430 million up to 2024, to be financed within the next budget.
- The *National Decarbonisation Programme* of approximately €1 billion up to 2023.
- The programme *Carbon Avoidance in the Basic Materials Industry* with funding of €370 million up to 2023.
- The *Carbon2Chem* research project, aimed at testing the option of carbon capture and use (CCU) in the steel industry (and other sectors), with funding of roughly €140 million (Phase 1: 2016–2020; Phase 2: 2020–2023).
- The *Research Initiative for the Avoidance of Climate-Related Process Emissions in Industry* ('KlimPro-Industrie') with funding of €80 million up to 2025.
- The programme *Regulatory Sandboxes for the Energy Transition* with funding of €415 million from 2020 to 2023.⁴

The National Hydrogen Strategy provides for an assessment of various funding programmes, including a tendering scheme for the production of green hydrogen for use in the steel and chemical industries.

The steel industry estimates that enormous financial outlays for investments will be needed in the long term to bring about the transformation: approximately €30 billion up to 2050, of which €10 billion

needs to be spent in the years to 2030.⁵ This need for investment as forecast by the industry has to be set against an annual turnover of approximately €32.8 billion (as of 2019), which is showing a downward trend due to the current situation (-10% for 01/ and 02/2020 compared to the same months of the previous year).⁶ It is not possible today to reliably predict whether the steel sector will be able to finance investments equalling about 3% of its annual turnover. It is clear, however, that adequate measures at all levels can support these investments if the industry is unable to finance them itself. In the long term, European and international market conditions need to be enhanced in such a way that the necessary investments are viable and profitable without depending on public subsidies. The Federal Government is working to ensure that the transformation concept for the steel industry is backed up from an early stage with the necessary policies and decisions. This also includes the creation of the necessary instruments at European level. These instruments need to be made available in time so that they can serve as a basis for upcoming investment decisions, particularly with a view to replacing blast furnace technology with direct reduction processes using – ultimately green – hydrogen. We will advocate that the necessary State aid rules are put in place at European level. Funding should be linked, for example, to IPCEI projects like those for semiconductors and battery cells.

For its part, the steel industry will make its contribution towards establishing these preconditions and implementing the aforementioned measures and is committed to making major investments in climate-friendly technologies in order to safeguard the future of the industry in Germany and to make a significant contribution towards a climate-neutral economy.

4 In line with the key points of the Structural Reinforcement Act for Mining Regions, 'regulatory sandboxes for the energy transition' that are conducted in areas affected by structural change are to receive further funding worth €200 million from 2020 to 2025.

5 Calculation by the German Steel Federation: Multiplying the rule-of-thumb amount of €1000 for every tonne of new crude steel production capacity by a primary steel production volume of around 30 million tonnes has produced a rough estimate of the investment required for a complete switch of the primary steel route to low-carbon processes.

6 Source: German Steel Federation, Federal Statistical Office, FS 42 111-3, GP08-24.1.

In cooperation with the Federal Environment Agency, the Centre of Excellence for Climate Action in Energy-Intensive Industries (KEI) in Cottbus has been created as part of the research and advisory infrastructure of the Federal Government. Similarly, research establishments receiving institutional funding such as the Max Planck Society and Fraunhofer-Gesellschaft are powerhouses of ideas that can provide advice on the future of energy-intensive industries in Germany, thus acting as mediators between the steel sector, civil society, science and the Federal Government on the path towards the transformation of the industry.

The Steel Action Concept

The steel industry in Germany: a key sector for the German economy and for the attainment of the climate targets

As a basic materials industry, the steel industry has a key role to play: it is an integral component of European and international value chains and networks. The manufacturing industry in Germany in particular is highly steel-intensive.

A decarbonisation of the industrial value chains can only succeed if the basic material, steel, is made using zero-carbon or at least carbon-neutral processes. Despite the considerable efforts made by the industry to improve its climate footprint, Germany's steel sector is one of the largest emitters of CO₂. In 2018, the carbon emissions of the German steel industry amounted to 58.4 million tonnes; this corresponds to approximately 30% of all industrial emissions. This illustrates the prominent role and responsibility the steel sector has to assume when it comes to decarbonisation. The Federal Government wants to support the transformation of the steel industry and aims to facilitate decarbonisation through funding programmes and by creating an adequate policy framework.

Climate-friendly steel production processes are also crucial to global climate action. Steel is one of the world's most-used materials. The upcoming developing and emerging economies in particular are reliant on steel. Germany and Europe need to play a pilot role and prove that a sustainable decarbonisation of steel production can succeed in technical and commercial terms – whilst also maintaining and increasing the sector's competitiveness. A relocation of the steel industry to countries with less ambitious climate rules (carbon leakage) cannot be an alternative, particularly with a view to global climate change mitigation. As a forward-looking technology, carbon-neutral or zero-carbon steel production and its climate-neutral downstream products provide economic opportuni-

ties that need to be promoted while maintaining and expanding value creation in Germany.

By applying steel in innovative ways, it can make a significant contribution to global climate action. Innovations in steel help to save energy and cut emissions in downstream parts of the value chain, e.g. by making vehicles lighter, providing the base material for climate-friendly installations or improving the efficiency of power stations. Steel has a long lifetime and is entirely recyclable. It is thus particularly useful for the re-use or re-making of products. This makes steel a key material for the circular economy.

Steel industry currently facing extraordinary challenges

The steel industry is explicitly committed to the Paris climate targets and to the EU's goal of becoming climate-neutral by 2050. This necessitates a conversion of production to carbon-neutral, or preferably zero-carbon processes. The transformation entails a substantial need for investment and clearly rising manufacturing costs. Mastering this challenge will require appropriate political backing. This must come promptly because investment cycles in the steel industry last a long time and some installations are currently on the verge of a new investment cycle.

In view of stiff international competition, the steel sector is particularly exposed to the danger of carbon leakage. Global overcapacities, caused in part by government subsidies, are distorting the global steel market and trading flows.⁷ The non-WTO-compliant U.S. import tariffs on steel are creating further disruption on the steel market and leading to diversions of substantial volumes to the EU market. The situation for the European steel industry is made even more difficult by the fact that steel-makers in third countries do not have to meet any comparable climate, environmental or social standards.⁸ As a result of the Euro-

⁷ Cf., inter alia, OECD, Steel Market Developments.

⁸ Cf., inter alia, OECD, G20.

pean Emissions Trading System and in view of energy and electricity prices that are relatively high in comparison with other countries, Germany's steel sector is already making a determined effort to reduce its energy demand as a way of cutting costs. A range of relief and allocation instruments, applied on a basis that is permissible under State aid rules, help to keep energy and electricity prices competitive. In return, beneficiaries need to fulfil certain justifiable conditions, e.g. to prove the existence of a certified energy or environmental management system.

Rising imports of steel from third countries made with the help of market-distorting government support, and a competition-induced relocation abroad of German production capacities, would represent a serious hit to Germany's industrial base and innovative capabilities. Network effects would mean that this would be felt well beyond the particularly affected steel-making Länder – Brandenburg, Bremen, Hamburg, Lower Saxony, North Rhine-Westphalia, Saarland and Saxony. Furthermore, this would be counterproductive for the climate, since Germany's innovative steel industry offers great potential for the development of technologies that will eventually enable steel production to become carbon-neutral or preferably carbon-free.

This means that the efforts to tackle the transformation are taking place against an extraordinarily difficult economic backdrop: last year, crude steel production in Germany dropped to 39.7 million tonnes (German Steel Federation)⁹. The only previous times production has fallen so low were – apart from during the financial crisis in 2009 – the steel crisis years of 1992 and 1996. A further slump in production is to be expected as a result of the coronavirus crisis. It is to be feared that global demand for steel will drop even more sharply than during the 2009 financial crisis and that the structural problems within the global steel sector will worsen.

Contribution of the steel industry to the 2030 climate targets

If we are to attain our national and European climate targets, a key role will be played by a reduction in process-related emissions and thus the transformation of steel production. Further progress on carbon avoidance is just as urgently needed as a fundamental conversion of production to climate-friendly structures. Given the lifespan of installations in the steel industry and in view of upcoming investments, it is vital to create investment security for forward-looking technologies as early as possible.

The steel industry in Germany is working on the introduction of low-carbon, carbon-neutral and zero-carbon processes – for example, using hydrogen rather than carbon to reduce iron ore (carbon direct avoidance, CDA) – and, to some extent, on ways of making further use of carbon within the industrial value network (carbon capture and utilisation, CCU). CDA offers great potential for the steel sector in Europe and for climate change mitigation. In addition, carbon capture and storage (CCS) may be a possible option for industrial process emissions that cannot be avoided in other ways. All three processes – CDA, CCU and CCS – still pose challenges, particularly as regards costs and public acceptance (in the case of CCS). Also, the scrap-based production of steel via the electric arc furnace route already offers a lower-GHG process for around 30% of the crude steel produced. This share can be increased, but only to a certain extent due to the limited availability of steel scrap. Moreover, due to varying alloy metal contents for certain higher-quality steel products, the suitability of the process is limited.

It looks likely that significant CO₂ reductions in the sector can already be achieved in the years up to 2030. However, for this to happen, the necessary policy

9 Cf. press release by the German Steel Federation of 28 January 2020, <https://www.stahl-online.de/index.php/medieninformation/rohstahlproduktion-in-deutschland-jahresbilanz-2019/2020>.

framework, including options for promoting the conversion to low-carbon production processes, needs to be in place, and the steel industry needs to start preparing the needed investments now. The steel sector can support the establishment of a hydrogen market.

The Federal Government considers only hydrogen that has been produced using renewable energy to be sustainable in the long term. It therefore seeks to use green hydrogen at competitive costs, promote its rapid market roll-out and establish the necessary value chains.¹⁰

The National Hydrogen Strategy provides an important basis for this.

Major centres of the steel industry and other energy-intensive industries can offer a large, reliable and predictable demand-side market for green hydrogen at an early stage, thus making an important contribution to the market ramp-up of hydrogen in Germany. This creates a basis for the establishment of the necessary infrastructure, which can then be used by other sectors. There are further synergies at steel-making sites, given that hydrogen is already being used in steel processing (as a reducing shielding gas) and that the oxygen produced during electrolysis can to some extent be used in electric arc furnaces.

Policy environment and need for an overarching policy concept

In the current political and economic environment, the steel industry, like other energy-intensive sectors, is reliant on a policy framework which prevents carbon leakage and facilitates the transformation.

The instruments must dovetail and be translated into an overarching policy concept which addresses vari-

ous challenges and safeguards the international competitiveness of the sector throughout the transformation period. Such a concept must embrace issues like the creation of incentives on the demand side for products which are climate-neutral but more expensive, a pro-innovation environment, investment promotion and funding for operational costs, and provision of the necessary energy infrastructure. The more efficient use of the characteristics of steel in the circular economy must also form part of such an overarching concept. At the same time, it must also address how carbon leakage can be prevented, a level international playing field established, and jobs in the steel industry future-proofed.

Creating a level playing field on the global steel market

Creating a level playing field on international markets

The external economic environment for the steel industry has changed dramatically in recent years. Particularly in China, but also in many other emerging economies, substantial capacities have been built up which do not correspond to the development on the demand side and thus violate fundamental market economy principles. The global overcapacities amount to several hundred million tonnes, and are currently increasing again after a slight decrease in 2018. As a consequence, competition-distorting trade practices like, in particular, dumping have become widespread in global competition.¹¹

At the same time, traditional importing nations are increasingly fencing off their steel markets in order to create competitive advantages for their domestic

10 Apart from that, the Federal Government believes that both a global and a European hydrogen market will emerge in the coming ten years and that carbon-neutral (for example blue or turquoise) hydrogen will also be traded on this market. Given Germany's close integration in the European energy supply infrastructure, carbon-neutral hydrogen will also be relevant for Germany and, if available, will be used on a transitional basis.

11 Cf., inter alia, OECD, Steel Market Developments.

industry. The United States is a case in point. The imposition of special tariffs on the pretext of national security (Section 232 of the Trade Expansion Act of 1962) is an intervention in international trade which breaches WTO rules and which, moreover, is causing trade flows to be diverted to the EU market.

In the field of trade, the Federal Government is working at EU level in the interest of rules-based free trade and compliance with WTO rules by all third countries. The EU has responded to the trade restrictions imposed by the U.S. on the steel market by initiating a WTO dispute settlement procedure, imposing countervailing duties, and adopting safeguard measures to protect the European steel industry. It will be necessary to assess how adequate protection can be provided following the expiry of the safeguard measures (from July 2021).

| Continuing the work of the Global Forum

The global overcapacities are continuing to amount to ten times the volume of German annual crude steel output. In the view of the Federal Government and the German steel industry, this problem can only be addressed multilaterally in the G20 context. Hopes are therefore continuing to be placed in the Global Forum on Steel Excess Capacity, which was founded in 2016 during the German G20 presidency. The focus of this multilateral cooperation is on the goal of reducing market-distorting subsidies and other non-WTO-compliant forms of state assistance in the various countries, and strengthening market-based adjustment processes on the global steel market. Industry and government agree that the work of the Global Forum on Steel Excess Capacity must be continued on the current basis and the goals defined in the G20 process must be achieved. The only way to keep exerting influence on the countries that are the chief contributors to the current overcapacities on the world market is via the G20. At the same time, every effort should be made to encourage China to rejoin the Forum.

| Expanding and rigorously applying trade-defence instruments

In addition, it is absolutely necessary to deploy the EU's trade-defence toolbox. The protective measures permissible under WTO rules must be rigorously and effectively applied.

- Safeguards are an important instrument to counter massive trade diversions. The Federal Government gave proactive political backing to the second review of the safeguard measures, aimed at giving a response in line with EU and WTO rules to the changed environment on the international markets. On 12 June, the Committee on Safeguards agreed on a number of adjustments that will enter into force on 1 July. The outcome of this adjustment must be effective protection for our domestic industry against the effects of diversions of trade. Otherwise, there will be a danger that efficient companies are disadvantaged by intervention from other countries and forced out of the market.
- Since the safeguards will expire in mid-2021, it is already necessary to ask how the steel industry in Germany and Europe can continue to be protected from trade diversions going forward. It is, after all, conceivable that the U.S. will maintain its special tariffs on steel. The list of steel products affected by the U.S. measures was extended only recently, in January 2020.
- In addition to the safeguards, resolute action against unfair market conduct by making full use of anti-dumping and anti-subsidy measures is also indispensable. In ongoing cases, the new possibilities opened up by the reform of the trade-defence instruments should be rigorously utilised. This includes expiry reviews of existing measures either ex officio or at the request of an EU manufacturer and extension of the measures where the preconditions pertain, for as long as the global market distortions continue. The Federal Government will give proactive backing to these efforts.

- Also, it is necessary to establish greater transparency about subsidies in third countries. The European Commission should examine whether the creation of a subsidies database can deliver greater transparency. At the same time, the Federal Government supports the discussions by the European Commission with the U.S. and Japan on the revision of the international rules on market-distorting subsidies. The aim is to establish greater transparency about subsidies at WTO level as well. Further to this, new bans on subsidies must be introduced, particularly on those that take the form of unlimited state guarantees, support for companies facing bankruptcy, and forgiveness of debt without anything being done in return for this.
- Fundamentally, the EU's existing trade policy toolbox needs to be further developed.
 - This includes the aim of persuading third countries to open up their procurement markets. The primary aim of the Federal Government is to persuade more third countries to make genuine concessions under the WTO's Government Procurement Agreement. The International Procurement Instrument (IPI) is to serve as a lever to strengthen the European Commission's negotiating position with a view to opening up procurement markets in non-EU countries. The Federal Government is aiming at a practicable sanction instrument under procurement law (cf. 2030 Industrial Strategy).
 - It is equally important to strengthen the Enforcement Regulation in such a way that violations of WTO law can be countered in the interest of the affected industrial sector.
 - Likewise, the European Commission's deliberations on a new instrument against distortions of competition within the internal market in the form of third-country subsidies are intended to help further the creation of a level global playing field. Germany will actively shape the debate, building on the White Paper adopted in June and the draft regulation planned for 2021.
- On 31 December 2020, the United Kingdom will leave the European Union and the EU internal market. Negotiations on an agreement establishing the future relationship between the EU and the UK are currently underway and are to be concluded by the end of the year. In view of the UK's great relevance as an important sales market for steel and goods containing steel from Germany, this is of very great significance for the steel industry.

Avoiding carbon leakage

Avoiding competitive disadvantages due to emissions trading

In view of the stiff international competition faced by a wide range of steel products, the steel sector is particularly at risk of carbon leakage. Effective protection against carbon leakage is necessary in order to permit investments in the future of the industry and to ensure that disadvantages in international competition which the EU ETS may pose for emission-intensive industries like steel-making can be avoided in the fourth trading period from 2021. The steel industry is particularly affected by high CO₂ and energy prices. As the steel sector points out, even if the existing measures to avoid carbon leakage are continued, a substantial proportion of CO₂ costs always remains in place. If the percentage of compensation remains unchanged but prices for emission allowances climb, the carbon costs to be borne by the companies themselves in absolute euro terms rise proportionately. Competitors from third countries without similar climate policies do not have to shoulder these costs. Against this background, as long as there are no effective approaches to CO₂ pricing in third countries, particularly our major trading partners – the Federal Government is calling for action in this context at international level – an adequate anti-carbon-leakage system for high-competition products from energy-intensive industries is indispensable.

Continuing free allocation and electricity price compensation

In order to avoid carbon leakage, free allocation and compensation for ETS-related rises in electricity prices are important instruments – not least in view of the ambitious European Green Deal – to relieve industrial installations of additional costs if these cannot be passed on via product prices.

Firstly, if carbon leakage is to be avoided under the prevailing market conditions, there remains a need for effective offsetting of the CO₂ costs for direct emissions. Product benchmarks for free allocation should continue to be oriented to the actual progress made on efficiency by the top ten per cent of installations of a given sector. Also, a cross-sectoral correction factor should continue to be avoided, since it would also put a strain on a sector's most efficient installations and would increase the overall burden of costs on industry when carbon prices rise in the 2021–2030 trading period.

Secondly, under current market conditions, there will continue to be a need for compensation for carbon-related increases in electricity prices in order to offset the indirect costs imposed by the EU ETS.

The Federal Government advocates in particular that the EU State aid guidelines for the 2021–2030 trading period should continue to permit effective compensation for indirect carbon costs in the production of pig iron and steel. In order to avoid unequal treatment of products of the same type which are made by companies in different industrial sectors, a uniform carbon leakage status should be ensured for products of the same type, e.g. for industrial gases. In general, the guidelines should be fleshed out to ensure that, in certain sectors, eligibility under State aid rules can also be assessed in line with qualitative criteria (e.g. iron ore mining / sinter) and at product level. Member states should be given the option to limit the indirect carbon costs a company has to shoulder to a percentage share of gross value added. The proposal to abandon the generalised approach of degressive aid inten-

sity is equally welcome. Lowering electricity efficiency benchmarks while limiting maximum aid intensity, however, is a point that is viewed critically.

Examining further carbon-leakage instruments

The existing carbon-leakage instruments have basically proved their worth. In addition, the European Commission is examining whether a border tax or alternative approaches can be designed in a legally robust manner in order to ensure the same degree of protection against carbon leakage. In any case, an impact assessment of the sort currently being undertaken by the European Commission is needed when considering a border adjustment system and potential alternatives; this assessment must also cover the administrative and especially the legal issues relating to WTO compliance. In view of the unresolved issues pertaining, in particular, to compatibility with WTO law, it is not possible today to predict whether a border adjustment tax will be able to replace the existing anti-carbon-leakage system in the long term and what kind of introductory and transitional periods the new system might require.

Avoiding further burdens on energy-intensive industry

In its Communication on the European Green Deal, the European Commission has announced its intention to conduct an impact assessment which will be the basis for a proposal to increase the European GHG-reduction target for 2030 under the European Green Deal.

The steel industry is willing to make an effective contribution towards attaining the GHG reduction targets set out by the Paris Agreement. In order to give proper backing to the transformation of the steel sector in its initial stages, the transition to and investments in new climate-friendly technologies could also be supported through the instruments of the EU ETS and through funding from the EU Innovation Fund. This could help facilitate long-term planning

and increase investment security for the fourth trading period while lowering the extent to which additional funding instruments would be needed.

| *Ensuring competitive energy prices*

In order to ensure the competitiveness of the steel industry here and to establish the preconditions for the success of the transformation, competitive prices for the purchase (including transport) of reliably available electricity and gas, including hydrogen, are crucial. At national level, it is therefore key to assess, where necessary, whether adequate compensation payments and restrictions on burdens in the field of climate and energy policy need to be continued or even further developed. The aim must be to ensure that internationally competitive energy prices make an effective contribution towards the competitiveness of energy-intensive industries. This includes assessing whether to continue the restrictions on the burden resulting from the EEG surcharge and CHP surcharge, both in the context of the special equalisation scheme and for self-supplied electricity. The Act on the Phase-out of Coal-fired Power Plants has enabled an assessment of the option of compensation for potential electricity price increases in the wake of the coal phase-out. The Federal Government seeks to continue peak equalisation, but is assessing whether to more specifically gear the existing energy tax concessions for fossil fuels towards Germany's climate targets. The Act on Emissions Trading in Fuels provides for mechanisms for avoiding double burdens and offsetting unreasonable hardships that may result from the national emissions trading system. The necessary scope in terms of State aid rules should be set at EU level when the Guidelines on State aid for environmental protection and energy are revised. In the promised reform of the Energy Tax Directive, it is important that its legal basis under EU law is retained and expanded in order to create incentives in terms of climate policy while maintaining consumers' competitiveness. The ruling of the European Court of Justice on the Renewable Energy Sources Act from March 2019 should be considered when assessing adequate ways of removing barriers to investment in

the field of low-carbon or blast-furnace-gas-based electricity generation in the Renewable Energy Sources Act.

Carbon contracts for difference, which could be used, for example, to offset the higher operating costs caused by the use of green hydrogen, offer an additional project-specific option for increasing the competitiveness of innovative climate technologies.

Working together to make progress on the transformation

The steel industry is called on to start now to make substantial investments in innovative technologies for the process of transformation. This offers market opportunities for innovative and climate-friendly products that will allow the development of future markets, but also implies rising costs for production at European sites, and will therefore impact on the international competitiveness of these sites if no effective safeguard or support mechanisms are in place.

The task for government is to develop a framework for the German and European sites that will permit low-carbon and eventually carbon-neutral – preferably carbon-free – production technologies to be developed and operated in a commercially viable and sustainable manner despite high investments and substantially higher operating costs. The Federal Government is already promoting the conversion to industrial production processes that are low in greenhouse gas emissions or even climate-neutral. The steel sector maintains a strong focus on transformational projects, since a large number of installations would face major reinvestments in traditional blast furnace technology up to 2030. Investing in forward-looking technologies that are low in greenhouse gas emissions could help, in a lasting way, to make Germany's steel industry fit for the challenges of the future. To this end, what is needed is a broader, more coherent blend of different policy instruments tai-

lored to the respective phase of the transformation, from the promotion of research, development, innovation and investment to incentives to use materials produced on a low-carbon, carbon-neutral or zero-carbon basis on the demand side, the offsetting of higher operating costs and the energy policy framework. Regulations motivated by energy and climate policy must be designed to contribute to the attainment of climate targets, support the energy transition and climate change mitigation, maintain competitiveness and establish a reliable basis for planning.

Establishing lead markets for CO₂-efficient steel and materials

In addition to stimulation of production-side transformation, efforts could also be made on the demand side. Adequate incentives and rules could prompt the users of basic materials to utilise green steel, for example, in their products despite the higher costs. These could include, for example, targeted instruments which make the use of basic materials produced on a low-carbon, carbon-neutral or zero-carbon basis more attractive (not least financially). Better and internationally comparable information about the carbon footprint of products can also help to encourage greater use of climate-friendly products.

Existing and future rules at national and EU level should be revisited to see how their overall CO₂ reduction effect can be enhanced through additional demand-side stimuli for more climate-friendly steel and other materials.

The European Commission has already announced initiatives to stimulate the markets for climate-neutral and circular-economy products in energy-intensive industrial sectors.

Also, ways are to be developed to boost the recycling and re-use rates. Similarly, in public procurement, e.g. in the context of the project for a climate-neutral federal administration, demand for green steel could be increased if particular consideration is given to prod-

ucts manufactured on a low-carbon, carbon-neutral or carbon-free basis.

Contracts for difference to offset the higher operating costs

At present – as will continue to be the case in the near future – the costs of producing low-carbon or green steel are significantly higher than those of conventional fossil-based processes, but the chemical and technological characteristics of the product do not differ from conventionally produced steel. Targeted incentives are therefore needed to safeguard the competitiveness of low-carbon or green steel.

In order to foster the market penetration of low-carbon, almost climate-neutral steel-making processes such as hydrogen-based direct reduction, one way forward is offered by the introduction of contracts for difference which either reduce or partially finance the higher operating costs compared with current production processes, and which decrease the uncertainty surrounding the development of the carbon price. These are (standardised) project-related contracts in which the state guarantees the company a defined CO₂ price and the company commits in return to contractually agreed emissions reductions via investment in innovative technologies. In theory, the state would reduce or partially offset the difference between the actual avoidance costs or the defined carbon price and the EU ETS price as long as the latter is below the guaranteed CO₂ price. This gives the investor the necessary reliable basis for planning, and makes it easier to finance such investments.

By financing the differential between the current carbon price and a contractually defined carbon price oriented to emissions avoidance costs, companies could be given the necessary security to invest in forward-looking technologies in line with the goal of greenhouse gas neutrality. Such state guarantees can be granted on the basis of individual projects, on a demand basis, or by public tender. Over-funding is prevented by securing the actual differential costs. The

differential costs can either be subsidised by the state or, to reflect demand-side responsibility, shouldered by steel consumers.

Contracts for difference need to be given specific rules under the EU State aid framework.

Within the framework of the National Hydrogen Strategy, the Federal Government decided to conduct a pilot process to test carbon contracts for difference in selected sectors. The steel industry lends itself well to such testing in the context of individual projects.

In addition to carbon contracts for difference, the introduction of moderate and gradually rising quotas for the use of climate-friendly or climate-neutral basic materials may also be assessed. Such quotas could sustain a long-term sales outlook, facilitate the establishment of green steel on the market and encourage lasting investment decisions. However, measures of this kind would require a clear and ambitious label to mark out the more climate-friendly or sustainable intermediate and finished steel products in a way that is easy to understand.

| *Energy infrastructure*

In the course of decarbonisation, the steel industry will become more energy-intensive. In order to create the preconditions for a sector-wide move to steel-making processes for a climate-neutral steel industry, large additional volumes of electricity, natural gas and hydrogen will be needed. If Germany is to have zero-carbon primary steel production across the board by 2050, at least 1.8 million tonnes of hydrogen will be needed each year assuming the same level of output. The current consumption of hydrogen for material applications in German industry stands at approximately 1.65 million tonnes¹². Today, much of this hydrogen is being produced using fossil energy sources (grey hydrogen). This means that the complete decarbonisation of the steel industry alone would more

than double the demand for hydrogen (assuming present levels of demand) – and this hydrogen would have to be green, i.e. produced by means of renewable energy (green hydrogen). Consequently, additional renewable energy capacities will have to be created in the period up to 2050 on top of the extrapolated trend based on current electricity consumption, and the production of green hydrogen will have to be promoted. It is equally important to lay the foundations for the import of substantial amounts of equivalent electricity and in particular green hydrogen from other parts of the world.

If there is to be a further improvement in the climate footprint of electric arc furnace steel-making, there must again be a further rise in the proportion of renewable energy in the electricity mix. This also means that high priority must be given to continuing and accelerating the expansion of the power grid. In order to ensure a stable and reliable supply, power-lines are needed which reach the final consumers. Wherever unreasonable competitive disadvantages occur, compensation payments and restrictions on burdens should safeguard internationally competitive prices for the purchase (including transport) of reliably available electricity and gas, including hydrogen. In certain fields of application, natural gas will continue to be needed for many years during the long-term transition to green energy sources.

| *Establishment of a hydrogen market*

The use of hydrogen promises to offer particularly great potential for CO₂ reduction in the steel industry, not least because relatively large CO₂ reductions can be achieved here compared with other sectors per unit of green hydrogen deployed. In the steel sector, this in fact applies even to non-green hydrogen produced on the basis of natural gas, as long as such measures are only temporary solutions in preparation for the later conversion to renewable hydrogen. The Federal Government's Hydrogen Strategy puts the

12 55 TWh according to the Hydrogen Strategy. Given an energy density of 33.33 kWh/kg, equates to 1.65 million tonnes.

necessary strategic basis in place at national level for the market penetration of hydrogen. The steel-makers are in a position to guarantee the stable take-off of large amounts of hydrogen on a predictable and reliable basis, thus playing an important role in the market development. It can also make sense to build electrolysis units at steel-making sites in particular, since the oxygen produced may possibly be used in electric arc furnaces and the heat generated during steel production is available for electrolysis. As a result, steel production might greatly benefit from the synergies resulting from geographical proximity to major renewable energy locations. This is because processes like electrolysis-based conversion of hydrogen and direct reduction of iron ore (DRI) may offer greater advantages if the installations are located in proximity to renewable energy production sites. DRI, after all, can be produced for stockpiling, which would offer valuable flexibility for electricity take-off – something that is becoming increasingly important and commercially attractive given the rise of renewable energy and fluctuations in energy generation. The Federal Government is supporting the steel sector in drawing up roadmaps and scenarios with a view to making German steel production climate-neutral by 2050. In view of the likely supply-side scarcity, during the developmental phase of the hydrogen market a special focus should be placed on areas which are already close to commercial viability, where major path dependencies can be avoided, or which cannot be decarbonised in other ways, as is the case in the steel industry.

Also, it is necessary to examine the extent to which there are ways to reduce the price of hydrogen for industrial use during the developmental phase – in relation to the actual carbon emissions saved as a result. A fair design of the state-induced price components of energy sources can help here. For this reason, possible reforms of the state-induced price components should be tackled.

In addition to needs-oriented construction of new pipelines, pipelines for natural gas which are currently unused or which become permanently free

could be rededicated. It is necessary to establish clarity in terms of the legal framework for the transport of hydrogen. This also means reviewing the regulatory environment for gas infrastructure.

Promoting the circular economy

The aim must be to take advantage of the positive characteristics of steel, particularly for the circular economy, in the interest of climate change mitigation and the reduction of carbon emissions. To this end, the current policy environment should be revisited, not least with a view to the sustainable use of steel, steel products and its by-products (e.g. slag). Germany heavily relies on imports particularly as regards steel alloying elements (e.g. chromium, nickel, tungsten, molybdenum) that are used for high-performance steel. That is why special emphasis should be placed on the high-quality recycling of these steel products and the critical raw materials they contain. The circular economy thus plays a pivotal role in securing the supply of raw materials for German industry and generates competitive advantages over steel-making that uses primary raw materials. Impediments exist wherever insufficient attention is paid to the options of longevity, repair, re-use and recyclability in the making, use and procurement of products. It would be possible in principle to create demand-side incentives for the production of low-carbon, carbon-neutral and zero-carbon basic materials by rewarding the use of steel scrap in materials production. With a view to improving the circular economy, with large positive effects for climate change mitigation, consideration should always be given to requirements for sustainable product design, including aspects like recyclability of materials and products.

Financial assistance for innovation and investments

To enable the conversion to low-carbon – by 2050, carbon-neutral but preferably carbon-free – steel-making processes, the sector estimates that roughly

€30 billion will need to be invested in Germany.¹³ On top of this, there are the investments in infrastructure to supply renewable electricity and hydrogen produced on a climate-friendly basis. In order to support this expenditure, the possibility to use existing funding sources under the Innovation Pact for Climate Action in Industry should be optimised.

According to a study¹⁴, reinvestment decisions will be due between 2025 and 2030 for roughly one-third of blast furnaces with a total production capacity of approximately 12 million tonnes. If it were possible to convert roughly half of these installations, with annual production of 6 million tonnes, to low-carbon processes by 2030, it would be feasible – assuming a complete conversion to hydrogen-based processes and sufficient availability of climate-friendly hydrogen – to save around 10 million tonnes of carbon emissions. This would represent a 17% fall from today's level. The steel industry estimates that such an endeavour would require additional investment of €5.4 billion. If, in the 2025–2030 period, all of the capacities due for reinvestment, i.e. for 12 million tonnes of crude steel, were to be converted to fully hydrogen-based processes, it would even be possible to cut 34% of emissions by 2030.¹⁵ However, this would require roughly twice as much investment.

In addition to European programmes such as the *EU Innovation Fund* and *Horizon Europe*, a wide range of

funding programmes, studies and other programmes are being launched in Germany as well. These include, for example,

- the *National Decarbonisation Programme* (budget estimate up to 2023: approx. €1 billion),
- the *Research Initiative for the Avoidance of Climate-Related Process Emissions in Industry* ('KlimPro-Industrie') (budget estimate up to 2025: approx. €80 million),
- the programme for the *Use of Hydrogen in Industrial Production* worth €15 million for 2020 as well as commitment appropriations worth €430 million up to 2024,
- the programme *Carbon Avoidance and Use in the Basic Materials Industries* with funding of €370 million up to 2023,
- the *Carbon2Chem* research project, aimed at testing the option of carbon capture and use (CCU) in the steel industry, with funding of roughly €140 million (Phase 1: 2016–2020; Phase 2: 2020–2023),
- and the programme *Regulatory Sandboxes for the Energy Transition* with funding of €415 million from 2020 to 2023.¹⁶

13 Calculation by the German Steel Federation: Multiplying the rule-of-thumb amount of €1000 for every tonne of new crude steel production capacity by a primary steel production volume of around 30 million tonnes has produced a rough estimate of the investment required for a complete switch of the primary steel route to low-carbon processes.

14 Agora Energiewende: *Klimaneutrale Industrie – Schlüsseltechnologien und Politikoptionen für Stahl, Chemie und Zement* (Climate-neutral industry – key enabling technologies and policy options for steel, chemicals and cement), November 2019, p. 174. In the 2020–2030 period, roughly 53% of blast furnaces with a total production capacity of approx. 18 million tonnes will be in need of reinvestment.

15 Calculations by German Steel Federation, contradicting Agora study. Agora assumes a hydrogen share of only 7.5 or 15% (the remainder being natural gas). Here: carbon savings that would result from a conversion of 6 or 12 million tonnes to processes that are COMPLETELY hydrogen-based. Agora assumes specific emissions of 1.71 t CO₂ per tonne of crude steel for the blast furnace converter process vs. 0.05 t CO₂ per tonne of crude steel for hydrogen-based direct reduction. The difference of 1.66 t CO₂ per tonne of crude steel represents specific carbon savings. This value is multiplied by 6 million (= approx. 10 m t CO₂) or 12 million tonnes of steel (= approx. 20 m t CO₂). Assuming a sectoral emissions level of 58.4 m t CO₂ (2018) per year, these absolute savings translate into relative savings of 17 or 34% respectively.

16 In line with the key points of the Structural Reinforcement Act for Mining Regions, 'regulatory sandboxes for the energy transition' that are conducted in areas affected by structural change are to receive further funding worth €200 million from 2020 to 2025.

The Federal Government is already providing a substantial amount of funding in this context, and is thus creating an incentive for the transformation to begin. The funding is intended to assist implementation on an industrial scale, and the corresponding funding programmes need to be approved, where necessary, under State aid rules. It is necessary to establish a reliable basis for planning by investors for the medium to long term and to design the measures in a way that lives up to the scale and time-line of the task.

The National Hydrogen Strategy provides for an assessment of various funding programmes, including a tendering scheme for the production of green hydrogen for use in the steel and chemical industries.

In the context of the European Green Deal, the revision of the State aid rules for environmental protection and energy planned for 2021 should create the necessary scope to permit effective promotion of investment, an offsetting of higher operation costs in the industrial-scale roll-out, and the use of renewable energy sources and technical gases like hydrogen, which is to become green in the long term. In particular, the rules governing the determination of eligible costs and relevant aid intensities need to be revised. In addition to this, the preconditions should be put in place for the possibility to combine several European, national and regional funding programmes for the same project, whilst ensuring observance of maximum permissible aid intensities and appropriate contributions from the companies themselves. The Federal Government and the German steel industry are committed to projects for sustainable low-carbon, carbon-neutral and zero-carbon steel-making in the context of a Hydrogen IPCEI and are considering participation in a Low Carbon Industry IPCEI.

In the medium to long term, European and international market conditions need to be enhanced in such a way that the necessary investments are viable and profitable without depending on subsidies.

The sustainable finance rules, which aim to strengthen the consideration the financial sector should give to sustainability issues, should also be designed in a way that support is given to the efforts by the sectors to transform their processes and to undertake the investments urgently needed for this.

Creating viable jobs for the future through training and skills development

The transformation of the steel industry is not only a monumental task for companies and in terms of environmental protection, but also, and above all, poses a challenge to employees. The success of the transformation will fundamentally depend on whether employees in the steel sector are prepared and trained for new tasks as they arise. If employees are not properly trained and their skills developed, investments in new technologies are pointless.

The switch to new production processes must not lead to lay-offs – on the contrary, it must secure long-term employment and open up fresh prospects both at company level and in terms of human resource development.

The Federal Government believes that companies need to develop viable concepts to determine how the training and continued employment of the workforce can be ensured and the future demand for skilled labour met. Works councils should be involved early in the development of new training and skills development concepts. Only through joint efforts and trusting cooperation can we meet the challenges that lie ahead.

The Federal Government has adopted a variety of measures that allow companies, including those with larger workforces, to receive funding in an unbureaucratic manner for measures in the field of further training and skills development. Companies from the steel sector are encouraged to use these opportunities:

- In addition to enhancing advisory services on further training and skills development, the Act on Opportunities to Gain Qualifications has improved the support available for further training for employees whose jobs are at risk of becoming lost to technologies, who are otherwise affected by structural change or who wish to obtain advanced vocational training for an occupation that is facing a skills shortage.
- The Act to Promote Advanced Vocational Training amid Structural Change and Enhance the Promotion of Training expands targeted forms of assistance available to employees and their employers in companies that are particularly affected by structural change. In addition, works agreements or collective agreements on advanced vocational training are rewarded. From 2021, it will also be possible to file a single application to receive the support.

In order to secure skilled labour for the steel industry, the potential offered by qualified workers from third countries may also be used. The Skilled Immigration Act aims to facilitate access to the labour market, in particular for third-country nationals with vocational training qualifications. In addition to improving the legal framework, special attention is paid to its practical implementation. The Act has introduced, among other things, improvements in administrative procedures and procedures for the recognition of foreign vocational qualifications, a common strategy with business for attracting skilled labour, and an improved marketing approach.

