DECARBONISATION IN THE MEDITERRANEAN

Case study: the impact of CBAM on Turkey

Master in Advanced European and International Studies

Mediterranean Studies- 2021 / 2022

Student:
Michele Rattotti

Supervisor:
George Tzogopoulos

Member of the jury:
Laurent Baechler

Institut européen
European Institute

Institut européen
European Institute

Abstract

Climate change is a global problem that needs joint and concrete solutions. However, some global actors are adopting stricter climate policies than others, due to structural or strategic reasons. The European Union emerges as a leading force committed to drive the international agenda on decarbonisation, thanks to the ambitious European Green Deal (EGD). Emissions trading seems to create convergence between economy and politics: in this research we explore to what extent the EGD and the proposed CBAM will be able to produce a change in climate targets and policies in the Mediterranean. The impact of CBAM on Turkey will be presented as a case study to demonstrate that the EU will have to pursue its climate action within a broader diplomatic and commercial outreach framework, in order to induce a real step change in the Mediterranean and globally.

Contents

Introduction

Research Question

The decline of the global influence of European Member States is being replaced by EU capacity to develop and set standards and benchmarks for the protection of its citizens, economies and environment. Thus, the EU is a world scale normative actor in many domains. Especially on environmental and climate change related issues the EU is the only credible actor to take the leadership by means of legislative and financial instruments and fiscal policies. This leadership role is confirmed, and at the same time challenged, in the so-called European neighbourhood, especially in the Mediterranean region. The same region is particularly exposed to the adverse effects of climate change but also has huge potential for the decarbonisation of the energy sector, resulting in overall reduction of greenhouse gas (GHG) emissions.

In the coming years it will become crucial for the two shores of the Mediterranean to cooperate closely in order to create a reliable partnership fighting climate change and building a sustainable regional development model.

In the context of the European Green Deal, the “Fit for 55” is a comprehensive package composed of several measures to reach carbon neutrality by 2055.

One of these proposals is the Carbon Border Adjustment Mechanism (CBAM), a legislative project aimed at preventing carbon leakage. The CBAM will equalise the price of carbon between domestic products and imports and ensure that the EU's climate objectives are not undermined by carbon leakage, i.e. the relocation of production to countries with less ambitious climate policies. The Green Transformation in the EU will have a far-reaching impact on our trade partners and neighbours.

An indirectly protectionist policy such as CBAM will have an impact on trade with third countries, and eventually on their climate policies. Thus, we will analyse the role of the EU as a global normative actor and progressively narrow the scope of the research to the situation in the Mediterranean (in terms of emissions, energy mix and climate action) and we will finally try to answer the question: **Will EU climate policy be a driver for decarbonisation in Mediterranean third countries?**

Hereby we assume that the EU will be able to lead a regional decarbonisation agenda only if its climate action will be supported by technical and financial assistance and extensive climate diplomacy dialogue with third countries.

Special attention is to be paid to the case of Turkey, a strategic partner of the EU, being involved in the Custom Union. The current political relations between Turkey and the EU are ambiguous, whereas the strong economic ties between the two countries are much clearer. In this context the introduction of CBAM raises questions about its impact on euro-Turkish relations.

The above general research question can be answered in the light of the case study on Turkey. In this view, we will address few specific sub-questions, such as:

- What are the implications of CBAM for Turkey?
- Is Turkey likely to adopt a carbon pricing policy to respond to CBAM?
- On which aspects of CBAM should Turkish representatives advocate in Brussels?
- How will EU-Turkey relations be impacted by CBAM in the broader context of EU climate policy?

Several factors regarding Turkey will be investigated, such as trade relations with the EU, energy and emissions profile, climate ambitions and potential effect on the concerned sectors. At the end, we expect to get a reliable picture of EU-Turkey relations after the implementation of CBAM and European climate policy at large, and to understand the real extent of EU climate leadership in the Mediterranean.

Methodology

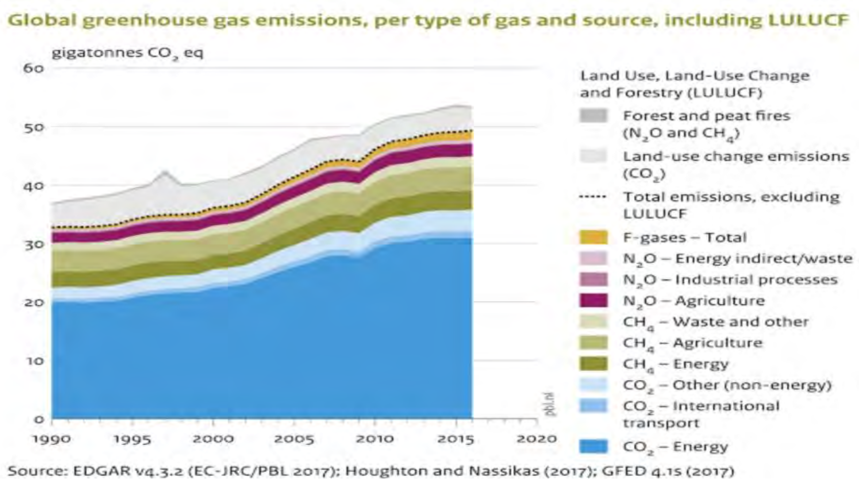
On the methodological level, a mix of qualitative and quantitative tools will be used. A series of academic articles and scientific publications will support the research about the EU climate policy and the energy and decarbonisation landscape in the Mediterranean. Primary sources like treaties, legislative texts and declarations will be taken into consideration. The literature about the impact of CBAM on Turkey is still not very developed at this stage, although some studies have already been carried out by specialized agencies and think tanks; these studies will provide the data and projections for the last section of this work. Other statistical data on trade and industrial production will be drawn from the International Energy Agency, World Bank, OECD and other official databases.

In addition, at the margin of the 12th Conference on Green Economy held in Istanbul on 10 June 2022 (organized by the German Heinrich Böll Foundation), Dr. Ahmet Atil Aşıci kindly agreed to release his expert opinion regarding some of the points and open questions raised in this research. His contribution clearly represent an added value for this research work and reflect the latest state of play in the discussion around CBAM in Turkey.

Disclaimers

C02 ≠ GHG

In this research we will mention both carbon dioxide (CO2) and greenhouse gases (GHG) emissions: it is crucial to make a distinction between the two concepts.
In fact, CO2 is just one of the many GHGs, notably the most abundant (accounting for more than two thirds of total GHG emissions). However, different GHGs have different global-warming potential. In order to cope with these differences, the notion of CO2 equivalent (CO2-eq) is useful in terms of homogenization. (Eurostat 2017).



Source: (PBL Agency 2017)

Negotiations on Fit-for-55

In this research we will extensively treat the proposed CBAM by the EU and mention the EU ETS. However, let us keep in mind that the full Fit-for-55 package, including both ETS revision and CBAM, is still under negotiation. The last policy update before the submission of this thesis was the European Parliament plenary vote on 9 June 2022, which rejected by majority the amendments proposed by the ENVI Committee on the ETS revision and thus postponed the vote on CBAM. For this reason, part of the information in this research might become outdated shortly following the new amendments that will be proposed by the ENVI Committee.

War in Ukraine

Another factor that might change the scenarios described in this research is the ongoing Russian invasion of Ukraine. The energy mix of many Mediterranean and European countries heavily relies on imports of fossil fuels from Russia.
The renewed emphasis on decarbonisation, coupled with the geopolitical necessity to get rid (where possible) of Russian energy supplies, will certainly change the energy mixes and basket of suppliers of the countries in the region during the coming years.

Section 1

EU Environmental Leadership

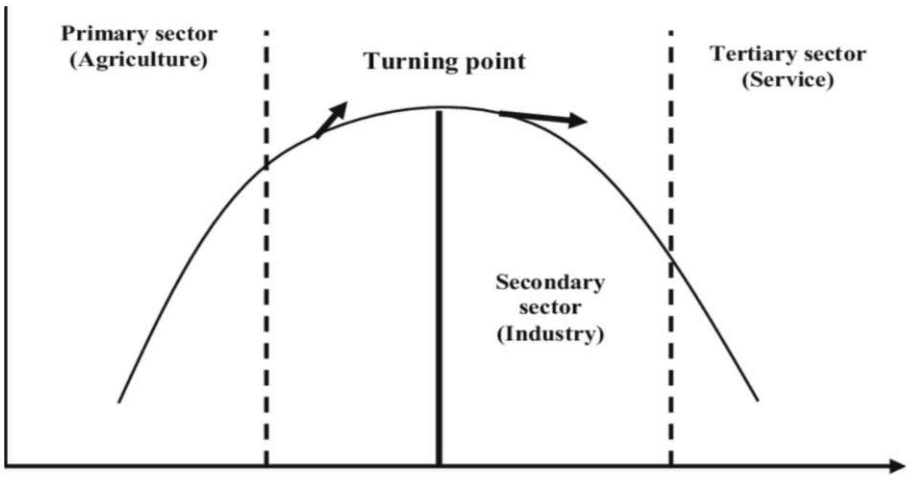
“It has become apparent throughout the last few decades, and now more than ever, that the European Union has taken the lead on environmental and climate action. However, while the EU has been the leading force behind binding international environmental policy targets, emerging economies will be central to a global sustainability transition. Unfortunately, there is no sign that any of them is ready to assume a leadership role, as they insist it must be played by high-income countries” (Clémençon 2016). The preeminent role occupied by the EU in this field can be explained according to both economic and political causes, as discussed below.
The former in terms of economic development and how it affects pollution rates, the latter in terms of how the institutional system allowed green instances to gain relevance and momentum in the European political debate.
The first set of reasons potentially explains why high-income countries usually perform better when it comes to tackling pollution, the second gives a perspective on why the EU seems to be more ambitious than the US in its emission reduction goal.

The Environmental Kuznets Curve

As explained above, some explanations are purely base on economic assumptions. Simon Kuznets proposed the idea of the Kuznets curve for the first time in 1954 in his paper “Economic Growth and Income Inequality”. The assumption at the basis of this concept is that as an economy develops, economic inequalities at first increase and then decrease: empirical evidence confirmed the validity of the curve at the time. Later, the Kuznets curve was applied to environmental indicators (greenhouse gas emissions and environmental degradation). In this context we speak of Environmental Kuznets Curve (EKC): the relationship holds that as an economy grows, the level of pollution increases to a given point and then decreases. In fact, in the early stages of economic growth, pollution emissions increase and environmental quality declines. However, beyond some level of per capita income (varying according to different

factors) the trend will reverse. Finally, at high income levels, economic growth leads to environmental improvement. Possible explanations entail that as countries get richer, they shift their polluting industrial production (such as iron-steel, textiles, cement, etc…) to low-income regions, thereby exporting pollution.
For instance, rich countries relocate their carbon-intensive sectors towards poorer countries by increasing foreign direct investments (FDI).
By changing their industrial production pattern, high-income countries experience better environmental quality as they export their polluted industries abroad.
However, except for emissions saved thanks to innovative technologies and improved efficiency, there is no reduction in total pollution on a global scale. On the contrary, increasing production in countries where environmental standards are lower results in more pressure on the environment.

Turning to the European Union, in the article "Economic Growth and Environmental Quality in the European Union Countries – Is There Evidence for the Environmental Kuznets Curve?", the relationship between economic growth CO2 emission during the period 1992-2010 was examined using official EU statistics. Even though the curve was not empirically confirmed, there is enough data to show that the EKC is applicable in EU countries, with a turning point for CO2 emissions as GDP per capita reaches the level of $23,000. (Mazur 2015)



Environmental Kuznets curve

The set of possible explanations is rather based on politics and institutions. Although the EKC proved to be a useful tool in understanding why the EU is a forerunner in the development of environmental policies, it does not provide insights on the reasons behind the major role played by the EU vis-a-vis other high income countries such as the US. EU's policies are so much more ambitious than other global actors and no other source of global leadership is emerging that could fill the gap. "The environmental movement is a social phenomenon that played an incredibly important role in the last century, witnessing a multiplication of civil society organizations active in this field. However, the extent to which environmental movement ideas have spilled over into the political mainstream discourse critically depends on existing political opportunity structures within domestic settings" (Clémençon 2016)

In the paper "Sustainable Development, Climate Politics and EU-Leadership: A Historical-Comparative Analysis" it is stated that "EU countries - where Green Parties at times have been able to critically shape policy direction - are the only actors that have developed the long-term socio-political and economic foundation for a coherent approach to sustainable development. Such a structural foundation on the other hand is missing in the United States and in key emerging economies" (Clémençon 2016)

"European environmentalism mainly originated out of the opposition to nuclear power and developed around the fight against air pollution in coal-fuelled industrial regions. A critical difference to the U.S. was that in Europe the representative parliamentary systems allowed Green parties to emerge as an actor in the formal political process. In this view, Green parties represent an institutionalization of the environmental movement that has reached its ultimate goal: direct representation in the political debate. In fact, proportional electoral systems proved crucial for channelling environmental instances into politics, allowing the environmental movement to formalize into Green parties. Such a possibility would finally result into direct influence over the political discourse and legislative process in many European countries, and ultimately on the EU level as well." (Clémençon 2016)

"Let us consider the case of Germany, a powerful influencer of European politics and economy. German environmental policy has been strongly influenced by the rise of the Greens: as the Green Party was growing, traditional parties on the left and the right were forced to pay more attention to environmental issues.
Over time, it translated into a centrist consensus around sustainable development targets. Even more importantly, after 1998 elections, the Socialists (SPD) relied on the Greens to form a government and had to assign them influential ministers and compromise on the exit from nuclear power and the introduction of a CO_2 tax.
On the contrary, despite attempts to show climate action leadership, American emissions reduction commitments are modest and face many challenges in the implementation phase. When it comes to the rest of the world, emerging economies are the real key actors to any long-term solution. However, they do not seem willing to take the lead on environmental issues for which they see high-income countries as primarily responsible." (Clémençon 2016)

For all these reasons, the EU remains the only actor that can realistically provide leadership on climate issues is the for the coming decades and the one that already has the normative and institutional framework on which a long-term approach to global sustainable development can be developed.
"However, the pressure on the EU to abandon a leadership role on sustainable development and climate change politics is growing. In facts, European industry leaders fear a negative economic impact of a go-it-alone approach. They have invested heavily in promoting the argument that Europe - accounting for a small share of world's emissions - cannot save the planet on its own, risking considerable economic loss if its industrial sector is driven out of the EU by cheaper and more polluting competitors from abroad. In conclusion, in the foreseeable future the EU is the only credible climate leader: the only club of countries that has collectively defined a vision of climate policy and sustainable development." (Clémençon 2016)

We have clarified why the EU has taken this climate leadership role and why should continue to do so; let us now look how it translates into practice.
European climate policy can be imagined (ironically) as a Russian doll of visions, frameworks, packages and norms. It is an intricate system of targets and legislative tools laid down in different texts, with different degrees of granularity and legal value.

Starting from the very general level, EU environment policy is founded on Articles 11 and 191 of the Treaty on the Functioning of the European Union (TFEU).
Under Article 191 TFEU, combating climate change is an explicit objective of the EU:
“1. Union policy on the environment shall contribute to pursuit of the following objectives: preserving, protecting and improving the quality of the environment, protecting human health, prudent and rational utilisation of natural resources, promoting measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change.
2. Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay. […]” (Consolidated version of the Treaty on the Functioning of the European Union (TFEU) 2009)
In this article, beside combating climate change, two of the guiding principles of EU climate action are stated officially: the precautionary principle and the “polluter-should-pay” principle.

Article 11 TFEU reads as follows: “Environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development.” (Consolidated version of the Treaty on the Functioning of the European Union (TFEU) 2009)
Not only the protection of the environment but also sustainability is mentioned as a

pillar for the development of an economic and social system aimed at ensuring the well-being of future generations.

In addition, sustainable development is an overarching objective for the EU, being committed to a ‘high level of protection and improvement of the quality of the environment’ according to Article 3 of the Treaty on European Union:
“[…] In its relations with the wider world, the Union shall uphold and promote its values and interests and contribute to the protection of its citizens. It shall contribute to peace, security, the sustainable development of the Earth […]” (Consolidated version of the Treaty on the European Union (TEU) 2009)

Guided by what laid down in the Treaties, in the European Parliament adopted the 2030 EU climate and energy framework, setting an EU target of 40 % for GHG emission reductions by 2030. In 2020, the European Council endorsed the Commission's proposal to raise the 2030 target to a 55 % reduction of the EU's net emissions: the aim is to become climate-neutral by 2050, i.e. shaping an economy with net-zero GHG emissions. This objective is at the core of the European Green Deal and in line with the EU’s commitment to keep the global temperature increase below 2°C and pursue efforts to keep it to 1.5°C, in line with the Paris Agreement. (European Parliament 2021). Figure 1 in the Annexes resumes the energy and climate and targets of the EU.

European Green Deal and Climate Law

Climate change is a pressing issue and a priority for the Von der Leyen Presidency of the European Commission. The sense of urgency of the EU toward this issue is well shown by the massive legislative production of the last few years, whose main courses were certainly the European Green Deal and the connected Climate Law.

European Green Deal

The European Green Deal (EGD) is presented by the Commission “as a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use” (European Commission 2019)

“In the words of Gaventa (2019) it is described as a climate project, aimed at making Europe a climate-neutral continent; as a social project, to support a just transition; as an economic project, seeking to rejuvenate EU investment and competitiveness; as a European project, to give new purpose and unity to the EU; and as an international project which will take a more geopolitical approach to global climate security”.
(Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU’s Carbon Border Adjustment Mechanism on the Turkish Economy 2021)
“To overcome the challenges of climate change and environmental degradation, the European Green Deal aims at transforming the EU into a modern, efficient and competitive economy, ensuring no net emissions of greenhouse gases by 2050; economic growth decoupled from resource use and no person and no place left behind” (European Commission 2019). In particular, when it comes to climate change mitigation, the “European Commission adopted a set of proposals to make the EU's climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030 and net-zero 2050, compared to 1990 levels” (European Council 2021). In practice, “climate neutrality by 2050 means achieving net zero greenhouse gas emissions for EU countries as a whole, mainly by cutting emissions, investing in green technologies and protecting the natural environment” (European Commission 2020). In order to attain the goals laid down in the EGD, one third of the 1800 billion euro investments from the Next Generation EU and the EU budget will finance the measures necessary to reach these ambitious objectives.

Climate Law

“On 24 June 2021, the European Parliament gave the final approval for the EU’s Climate Law — a bill that translates into law the objectives set out in the European Green Deal of becoming climate neutral by 2050. In addition, the law also sets the intermediate targets of reducing net GHG emissions by at least 55% by 2030, compared to 1990 levels” (Heinrich Böll Stiftung 2021). “The law aims to ensure that all EU policies contribute to this goal and that all sectors of the economy and society share the burden and benefits of such transformation. The official declared objectives are: outline the long-term strategy to meet the 2050 climate neutrality objective through all policies, ensuring social fairness and cost efficiency; set a more ambitious EU 2030 climate target; create a progress monitoring system; provide predictability for investors and stakeholders; ensure that the transition to climate neutrality is irreversible." (European Commission 2021). "The European Climate Law sets a legally binding target of net zero greenhouse gas emissions by 2050, meaning that the EU Institutions and the Member States are bound to take the necessary measures at EU and national level to meet the target, taking into account the importance of promoting fairness and solidarity among Member States." (European Commission 2021)

Fit-for-55 Package

On 14 July 2021 the European Commission proposed the "Fit-for-55" package, the largest ever series of legislative proposals on how to reach the intermediate goal of at least 55% GHG emissions reduction by 2030. The package includes different wide-ranging proposals, touching several productive sectors.

"For instance, a substantial volume of emissions reductions is in the revision of the **Effort Sharing Regulation (ESR)**. It regulates emissions not covered by the EU emissions trading scheme (ETS) - accounting for around 60% of total EU emissions - by setting binding national GHG targets for each Member States.

A report by the Heinrich Böll Stiftung provides a useful summary of the main proposals included in the package:

In 2009 the EU adopted the **Renewable Energy Directive** (RED I), setting an overall target of a 20% share of energy from renewable energy sources in the final consumption by 2020. It was substantially revised in 2018 (RED II), with a new goal of at least 32% of renewables in final consumption by 2030.

With the **Regulation setting new CO2 emission standards for cars and vans** the European Commission is likely to set a 2035 binding zero emissions target for cars, translating into the formal phase-out of internal combustion engines in the EU.

The EU is also considering upgrading car CO2 emission reduction targets to 60% by 2030 and setting a new 2035 target of 100%.

The **Revision of the LULUCF Regulation** aims at the inclusion of GHG emissions and removals from land use, land use change and forestry (LULUCF). Boosting carbon sequestration by protecting and restoring forests, is a chance to mitigate climate change and loss of biodiversity.

The **Energy Taxation Directive** (ETD) establishes the EU framework for the taxation of electricity and fuels. The European Commission will propose that Member States link taxation to the energy content of the energy sources, coupled with their environmental performance." (Heinrich Böll Stiftung 2021)

Beside the above mentioned policy files, the "Fit-for-55" package also includes other two major proposals, which are at the core of the current debate and of this work. These proposals both concern the system of industrial emission trading, namely the revision of the **Emissions Trading Scheme** (ETS) and the **Carbon Border Adjustment Mechanism** (CBAM). These two policy proposals will be discussed more in detail in the coming chapters.

The EU ETS and its Revision

Let us start this introduction on emission trading and carbon border adjustment with a little bit of history and theory. "Regulatory market-based environmental policy approaches have emerged in two basic forms: fiscal instruments such as carbon taxes on energy use and trading of pollution rights" (Clémençon 2016).

"Currently, there are 61 national carbon pricing mechanisms, 31 of which are emissions trading systems and 30 of which are carbon taxes, already implemented or planned to be implemented in the world" (Atil Aşıci and Acar, Towards a Green Deal in Turkey: Potentials of EU-Turkey cooperation on the green transition 2021).

On one hand, "in the early 90s, the European Commission proposed a European carbon tax that would have resulted in progressively taxing energy consumption. Many Member States unilaterally introduced carbon taxes, however they almost

exempted their most energy-intensive sectors fearing a loss economic competitiveness in exports” (Clémençon 2016).
On the other hand “emissions trading consists in governments setting an overall emissions cap. Industries falling under this cap can reduce pollution through investments in energy efficiency and carbon storage and sequestration technologies, or switching to renewable energies, or purchase emission rights from other entities, if it comes cheaper” (Clémençon 2016).
Clearly, “emissions permits are not a physical commodity, meaning that their demand almost completely depends on states’ capacity to set sufficiently low emission caps at and to do adjustments with the right timing. This system requires producers operating in the relevant industries to purchase carbon permits (allowances) on the carbon trading markets, in case their emissions exceed the limits” (Clémençon 2016).

Regulatory authorities usually provide a number of free permits to prevent carbon leakage. In short, “carbon leakage” is referred to as the problem of manufacturers moving their production outside the concerned area in order to avoid carbon pricing and maintaining the emission levels. Thus, any system designed to lower emissions only in one region of the world would have a limited impact on a global scale. The topic will be discussed more comprehensively in the next chapter.

The EU implemented an emissions trading system (ETS) in 2005, as a measure to meet the requirements laid down in the Kyoto Protocol: it is the world's first international emissions trading scheme and the EU's major policy to fight climate change.
Currently, “under the ETS mechanism, the EU prices the Scope 1 emissions under the following energy and carbon-intensive sectors: electricity and heat generation; energy-intensive industry sectors including oil refineries, steel works, and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids and bulk organic chemicals; commercial aviation within the EEA” (European Commission 2005).
“GHG emissions are categorised into three Scopes by the most used international accounting tool, the Greenhouse Gas Protocol:

- Scope 1: direct emissions from owned or controlled sources
- Scope 2: indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company
- Scope 3: all other indirect emissions that occur in a company's value chain"

(Carbon Trust 2022)

"The EU ETS determines the price of carbon emissions and reduces the ceiling of emissions from specific sectors of the economy each year. On 1 January 2021 it entered its fourth phase, further tightening the overall emissions cap (by 2.2% each year, compared to a reduction of 1.74% per year in the third phase)" (Climate Focus 2021)

The EU ETS sets prices for GHG emissions permits for about 11,000 industrial and power plants, including airlines, accounting for around 40% of the EU GHGs.
Though a certain number of free allowances is distributed to prevent carbon leakage, the EU has been issuing ever falling emission free allowances to specific sectors. However, after a period prices for carbon emission credits collapsed in 2008 resulting in an oversupply of permits that has undermined the system. All in all, the EU's GHG emissions have fallen in the decade since the ETS became operational, but there is almost no evidence that the ETS is the cause of such reduction. In fact, emissions trading taking place under an overall emissions cap does not incentivise industries to take the necessary steps toward decarbonisation if the price of emissions rights stays as low as it has been the last decade.

"Now, after years of very low and therefore barely effective prices, a mix of reforms and the pressure of tougher climate legislation has driven prices to more than €50 per ton of emitted carbon today. In addition, the number of permits, a limit to free permits and an expansion to new parts of the economy such as maritime shipping is up for debate" (Heinrich Böll Stiftung 2021). "Under the Commission's new proposal for a revised ETS, however, the number of free allowances for all sectors will decline over time so that the ETS can have maximum impact in fulfilling our ambitious climate goals" (European Commission 2021). Furthermore, for the CBAM sectors (as discussed in the next chapter), the free allowances will gradually be phased out as from 2026. "The Commission proposes to lower the overall emission ceiling even further and to increase the annual rate of emission reductions. In addition, the gradual phasing-out of free emission allowances for aviation and alignment with the global carbon offsetting and reduction mechanism for international aviation and including shipping emissions for the first time in the EU ETS" (Deloitte 2021).

On 8 June 2022, the European Parliament did not adopt the ENVI report on the revision of the Emissions Trading System (ETS). After the vote, MEP Canfin (Renew), chair of the ENVI Committee, announced that lawmakers would try reaching an agreement within two weeks. "We give ourselves 15 days to reach an agreement and vote this essential climate reform on 23 June" (Canfin 2022).

Carbon Border Adjustment Mechanism

CBAM in Theory

The European Commission has recently proposed to introduce a Carbon-Border Adjustment Mechanism (CBAM). How does it relate to the ETS?
"As part of the programme to cut carbon emissions, the EU will reduce the amount of carbon allowances that companies can buy in its ETS. Made simple: the cap on total emissions will go down and the price for permits will go up. As anticipated, the EU proposed to reduce the number of free ETS allowances to protect global competitiveness and to avoid carbon leakage. In this scenario, the risk is that users of these products will substitute their European suppliers with non-European suppliers that don't have to pay carbon price in the EU. The carbon will just be emitted elsewhere" (Erixon 2021).

"As proposed, the CBAM complements the EU ETS by creating a system of notional allowances: declarants have to purchase a sufficient amount of certificates each year to cover the emissions associated with covered imports during the preceding calendar year. The CBAM complements the EU ETS by applying an equivalent set of rules to imports of covered goods into the EU customs' territory." (ERCST 2021)

"To ensure fair competition between EU and extra-EU businesses, once the full CBAM regime becomes operational in 2026, the system will adjust to reflect the revised EU ETS, in particular when it comes to the reduction of available free allowances in the sectors covered by the CBAM" (European Commission 2021).
However, the CBAM departs from the ETS in some limited areas, in particular since it is not a 'cap and trade' system. Instead, the "European Commission highlights that, in order to preserve its effectiveness as a carbon leakage measure, the CBAM needs to reflect closely the EU ETS price" (ERCST 2021)

CBAM in Practice

As laid down in the proposal, EU importers will have to register with national authorities to buy carbon certificates corresponding to the carbon price that would have been paid if the goods had been produced under the EU's carbon pricing rules. The price of the certificates will be calculated depending on the weekly average price of EU ETS allowances expressed in € / tonne of CO2 emitted.
"Conversely, once a non-EU producer can show that they have already paid a price for the carbon used in the production of the imported goods in a third country, the corresponding cost can be fully deducted for the EU importer. Moreover, the CBAM will help reduce the risk of carbon leakage by encouraging producers in non-EU countries to green their production processes" (European Commission 2021).

"To provide businesses and other countries with legal certainty and stability, the CBAM will be phased in gradually and will initially apply only to a selected number of goods at high risk of carbon leakage: iron and steel, cement, fertiliser, aluminium and electricity generation. It is worth mentioning that the EU is one of the largest global importers of cement (3%), electricity (14%), fertilisers (10%), iron and steel (9%) and aluminium (17%). Altogether, if the EU were to implement CBAM, 11% of global imports of all these products will be affected" (Erixon 2021).
"This means that the CBAM will only begin to apply to the products covered gradually and in direct proportion to the reduction of free allowances allocated under the ETS for those sectors. Put simply, until they are completely phased out in 2035, the CBAM

will apply only to the emissions that do not benefit from free allowances under the EU ETS, thus ensuring that importers are treated fairly compared to EU producers" (European Commission 2021).
Figure 2 in the Annexes shows the EU Top 5 suppliers for each CBAM-covered product.

Direct vs Indirect Emissions

"Initially, CBAM will cover direct emissions (scope 1) of the above mentioned sectors. The GHG emissions regulated by the CBAM correspond to those emissions covered by Annex I to the EU ETS, namely carbon dioxide (CO2), but also nitrous oxide (N2O) and perfluorocarbons (PFCs). Indirect emissions (scope 2) will not be covered in the initial phase but can be added after the transitional period and upon further assessment by the European Commission" (European Commission 2021).

However, for certain carbon-intensive industries, indirect emissions resulting from electricity use represent the largest climate impact: we will address this problem later. Many expect the inclusion of indirect emissions after the CBAM review.
On one hand, including Scope 3 emissions of covered inputs entails clear WTO legal risks, and complicates the administration of the scheme.
On the other hand, not including Scope 3 emissions would just shift the risk of leakage further down the value chain. (European Commission 2021)

Legislative Iter: the Council and the Parliament

On 15 March 2022, the Council reached agreement (general approach) on the Carbon Border Adjustment Mechanism (CBAM). Compared to the initial proposal by the Commission, "the Council opted for a greater centralisation of the CBAM governance, where it makes sense and contributes to greater efficiency.
The Council still has to make sufficient progress on the phase-out of the free allowances allocated to industry sectors covered by the CBAM, established by the EU ETS directive. The Council also identified a minimum threshold exempting from the CBAM costs for a value lower than €150. This is meant to reduce the administrative burden, as a substantial amount of permits would fall under this category and their

aggregate value represents a small share of GHG emissions of total CBAM products imports. Once sufficient progress will have been achieved at the Council, the Council will start negotiations (Trilogues) with the European Parliament" (Council of the European Union 2022).

"The Environment Committee (ENVI) of the European Parliament voted on the CBAM and the EU Emissions Trading System (ETS) on 17 May 2022. The report has been adopted in the ENVI Committee by a majority of 49 votes for, 33 against and 5 abstentions. The Environment Committee members agreed on the need for CBAM to reduce global carbon emissions by incentivising the reduction of emissions in non-EU countries and to prevent the risk of carbon leakage.
However, MEPs propose a number of changes to the original EU Commission proposal with the aim to increase climate ambition.
MEPs want CBAM to cover aluminium, hydrogen, polymers and organic chemicals in addition to the products proposed by the Commission.
All other sectors falling under the EU ETS should be gradually included from 2030, the report states. These sectors should have their free allocations phased out in the following four years. This would mean that by 2035 there should be no free allocation within the EU market for ETS sectors.
To better reflect CO2 costs for European industry, MEPs also want to extend CBAM to include indirect emissions from the beginning (see previous chapter).
In addition, the European Parliament wants CBAM to be fully implemented for all sectors of the EU ETS by 2030, five years earlier than proposed by the Commission.
Furthermore, to avoid double protection, any free allowances granted to EU industries in the ETS should be fully phased out by 2030 when CBAM becomes operational.
In the ENVI report, coherence between the CBAM and the EU ETS is deemed essential to respect the principles of the World Trade Organisation (WTO) and that CBAM must not be misused as a tool to enhance protectionism.
Another point raised in the report, rather than having 27 competent authorities, MEPs believe there should be one centralised EU CBAM authority, which would be more efficient, transparent and cost effective" (Bioenergy International 2022)

The European Parliament plenary vote took place on 6-9 June 2022. Due to the rejection of the ETS revision in the European Parliament plenary of June 8, MEPs decided to postpone votes on the CBAM, as it is linked to the ETS vote. Once the report is adopted by the Parliament, the negotiations with the Council can start.

Critics

"While some metal products are covered by CBAM, most of the goods using these products are not included in the scope of CBAM, meaning that importers in Europe could potentially shift their imports to a refined version of the product without having to pay a CBAM fee. In that scenario, CBAM could cause carbon leakage by the reallocation of carbon emissions and value added away from Europe.
The EU should be very careful about the diplomatic consequences of CBAM and the compatibility with the rules of the World Trade Organisation (WTO).
In fact, many of the affected exporting countries might be likely to respond.
Some may impose similar measures; others may retaliate differently.
Beside WTO compatibility concerns, the EU should invest its soft power capital in bringing the message that CBAM is not an attempt to introduce a 'disguised restriction on international trade'" (Erixon 2021).

CBAM Revenues

Finally, the December 2020 Interinstitutional Agreement on budget and own resources identified revenues from CBAM as a potential EU own resource that will contribute to the EU's budget. As indicated by European Council, the proposal allocates the entirety of the revenues generated by the CBAM to the EU's "own resources", to repay the debt generated under the COVID-19 recovery package.
"The European Parliament, the ENVI committee in particular, wants the revenues generated by the sale of CBAM certificates to go to the EU budget. They add that the EU should spend CBAM revenues to support the decarbonisation of industry in least developed countries. This support would help meet the EU's climate objectives and international commitments, such the Paris Agreement" (Bioenergy International 2022).

Section 2

Introduction

After having observed EU Climate Policy from different angles, let us now turn to the Mediterranean as one of the indirect recipient of this policy: in fact, countries in the region often have tighter relations with the EU than between themselves.

The geographical proximity and strategic interest of the EU for this region is evident and cooperation is destined to grow well beyond security issues, expanding its reach into fields such as climate and environmental action, energy cooperation, market integration and technology transfer.

This section will investigate the situation in the Mediterranean region concerning aspects such as varying degrees of climate ambitions, current energy mixes and renewable energy plans, emissions and energy profiles, cooperation projects.

The section will show that although the region is politically fragmented and resources are unevenly distributed across countries, there is high potential for renewable energies in terms of satisfying the domestic demand, but also for export towards Europe. Provided an effective cooperation framework, political stability and appropriate funding, the region can become a hub for the decarbonisation of the energy sector. The implementation of adaptation strategies to climate change is already a reality on both shores of the Mediterranean, however mitigation efforts should play a major role compared to the current situation.

In this view the decarbonisation of the energy sector, in particular electricity production, is a priority to be addressed jointly by the EU and its neighbours.

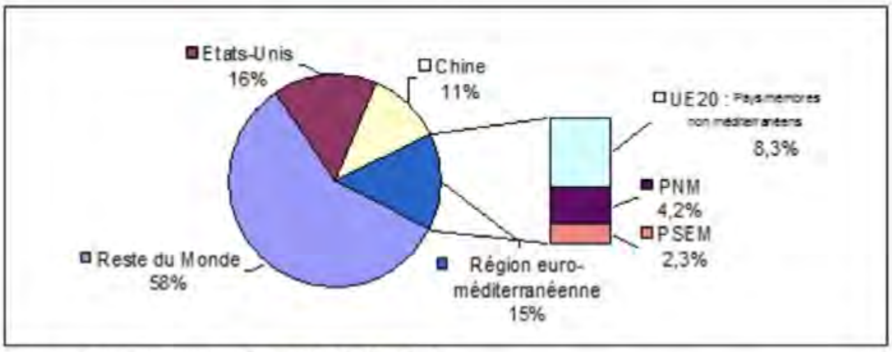
At the end of this section it will be possible to visualize the complex landscape of energy and emissions in one of the least integrated regions in the world and also one of the most exposed areas in terms of climate change. In this chapter we will refer collectively to the Southern and Eastern Mediterranean sub-region (SEM) as composed of 11 countries, namely: Algeria, Egypt, Libya, Morocco, Tunisia, Turkey, Israel, Jordan, Lebanon, Palestine and Syria. Please note that figures sourced from different publications name this group of countries differently (MED-11, SEMC, PSEM).

Emissions Profile

An effective analysis of the SEM sub-region climate and energy profile should necessarily start by mapping the emissions landscape in the sub-region, as a crucial step to finally get a clear picture of the mitigation efforts that are to be taken.

Let us start by framing the euro-mediterranean region emissions in reference year 2000. The whole region (including EU countries) accounted for 15% of global GHG emissions, while only considering the SEM sub-region (in the figure below referred to as PSEM), the share represented 2,3% of total global emission. (FEMIP 2008)

Figure 6 - Global breakdown of anthropogenic GHG emissions, TECO2, year 2000. World total emissions of 42 billion TECO2



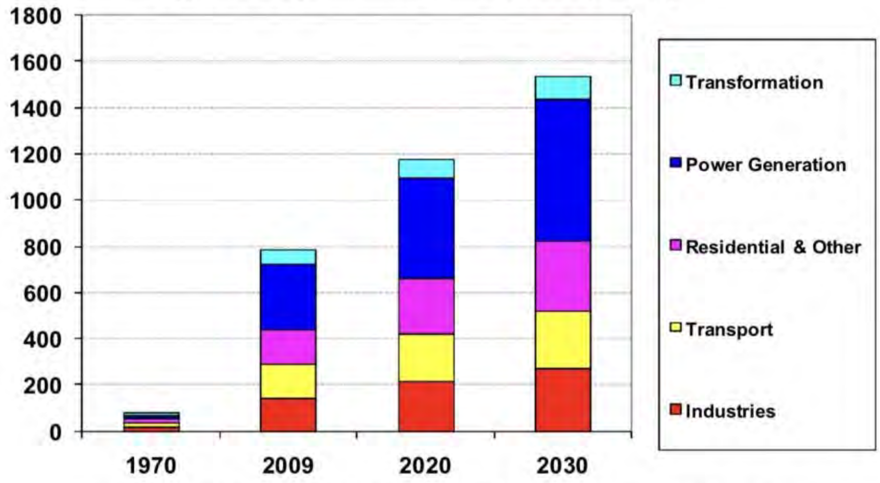
Source: Plan Bleu computations and formatting after WRI CAIT data for 2000.
Notes : Percentages related to anthropogenic GHG emissions standardised as CO2 equivalent (global warming power over 100 years, IPCC recommendations [1996]). Plan Bleu estimates based on aggregated data for 2000, as provided by the on line WRI CAIT interface. The data are derived based on a sectoral approach (particularly for non CO2 gases). Emissions due to land use change and forestry - LUCF (Houghton, 2003) are included, subject to reserve on estimate uncertainty. This sectoral approach tends to underestimate the total non CO2 gas emissions, particularly for the SEMCs. International fuel reservoirs are also incorporated in the data presented.

Source: (FEMIP 2008)

More recent data would present a situation where EU stagnating economic and demographic growth, coupled with energy efficiency measures, have positively impacted the emission reduction, while at the same time the eastward (big bang) enlargement of the Union in 2004 have negatively contributed to emission reduction, overall resulting in similar values. At the same time, SEM countries' sustained growth considerably increased the absolute volume of emissions in the sub-region.

The second step is an overview of the historical development of CO2 emissions between 1970 and 2030 (estimates) in the SEM sub-region, in absolute terms. In parallel with economic and demographic growth, emissions have increased exponentially (almost twelve-fold in 2020), with power generation accounting for the biggest share of emissions. Keeping CBAM application scope in mind, we should not forget that the proposed policy covers not only selected industrial products, but also electricity (falling under power generation).

Figure 3. CO_2 emissions in the MED-11 (Mt CO_2)

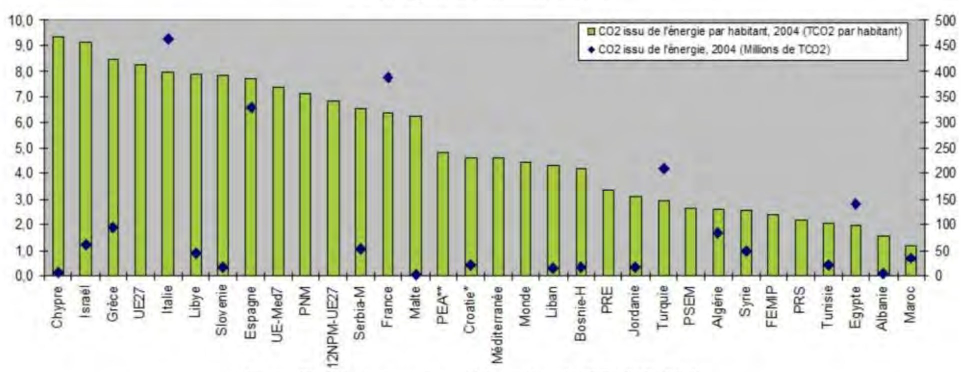


Source: Own elaborations for the MEDPRO Energy Reference Scenario.

Source: (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012)

In the figure below we can compare absolute emissions of CO2 against per capita emissions of CO2 due to energy use in the euro-mediterranean region.
Except for Israel and Libya, every other SEM country presents per capita levels below the world average, while in absolute terms Turkey and Egypt are the greatest CO2 polluters, although well below Italy, France and Spain.

Figure 9 - Absolute emissions (right hand side scale) and per capita emissions (left hand side scale) of CO2 due to energy use by region and country in 2004.



Source : Plan Bleu computations and formatting after WRI CAIT 5.0 data

Source: (FEMIP 2008)

If we consider the overall CO2 per capita emissions (not only emissions deriving from energy use) outlook in 2013, the figure below shows a similar situation compared to the previous one, with Libya and Israel still being considerably above other SEM countries, almost ten years after.

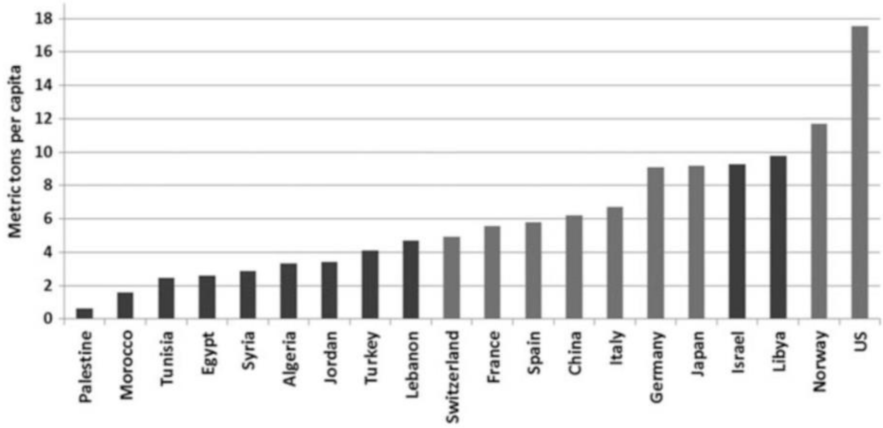


Fig. 4.19 Per capita CO_2 emissions by country (2013) (*Source*: Author's elaboration on World Bank, World Development Indicators, accessed in March 2016)

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

Last but not least, observing the trend in CO2 emissions growth in the period 1980 - 2013, it is not a surprise that not a single country of the SEM sub-region have experienced negative growth in CO2 emissions, although with considerable differences from country to country: Egypt having the highest growth rate and Libya the lowest, but still positive growth rate.

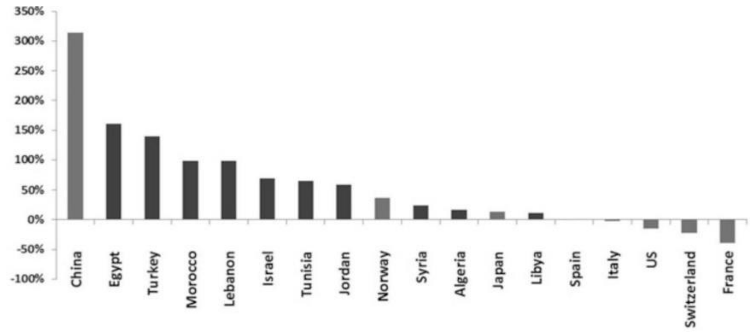


Fig. 4.20 Trend in CO_2 emissions growth by country (1980–2013) (*Source*: Author's elaboration on World Bank, World Development Indicators, accessed in March 2016)

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

Interestingly, comparing the last two figures, we can observe that in the SEM sub-region the highest growth rate corresponds to the lowest per capita values (Egypt) and vice versa (Libya).

Overall, the CO_2 emissions landscape in the SEM sub-region can be assessed as growing substantially in absolute terms over the last decade, with considerable differences across countries for some indicators (if compared to the sub-regional average) and power generation being by far the most important source of emissions (in line with global trends).

Energy Profile

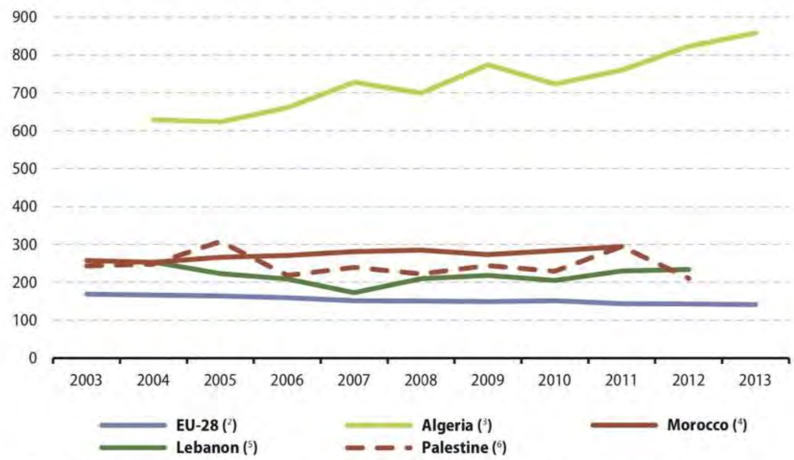
Energy Intensity & Carbon Intensity

We can start this chapter by introducing the concept of energy intensity and carbon intensity, once these are clarified it will be easier to understand the differences in energy consumption patterns across the Mediterranean.

“Energy intensity is the amount of energy used to produce a unit of GDP. It is the indicator generally used to measure the energy efficiency of a country’s economy” (European Environmental Agency 2019).
Carbon intensity is the measure of CO_2 produced per unit of GDP. In other words, it's a measure of how much CO_2 we emit when we generate one unit of GDP in our economy. Thus, we can infer that the more an economy is energy intensive and carbon intensive, the higher the level of emissions will be.

Let us now turn the focus to the South and East Mediterranean sub-region: over the last few decades, SEM countries have not sufficiently invested in energy efficiency and, for this reason, the energy intensity in these countries remains up to two times higher than in the EU. In the decade 2003-2013 energy intensity remained overall stable in the countries analyzed in the figure below, with the exception of Algeria considerably increasing its energy intensity levels. Palestine and Lebanon present lower values with some fluctuations during the decade. The EU saw a slight decrease and Morocco witnessed a slight increase, but both did not experience major fluctuations.

Figure 10.8: Development of energy intensity, 2003–13 (1)
(kg of oil equivalent per thousand EUR)



(1) Energy intensity has been calculated as the ratio of gross inland consumption (in tonnes of oil equivalent) to the gross domestic product (in EUR, in 2000 constant prices). Egypt, Israel, Jordan, Libya, Syria and Tunisia: incomplete or not available.
(2) 2005 constant prices.
(3) 2003: not available.
(4) 2012 and 2013: not available.
(5) 2003 and 2013: not available.
(6) 2004 constant prices. 2013: not available.
Source: Eurostat (online data codes: tsdec360, med_eg10 and med_ec1)

Source: (Eurostat 2015)

Let us take into exams a longer time span ranging from 1980 to 2008, again Algeria's energy intensity is very volatile, almost doubling during the reference period. However, major fluctuations also occurred in Jordan, Libya and Syria.

Table 4.1 Final energy intensity 1980–2008 (in thousand tonnes oil equivalent per USD GDP (PPP) 2005)

	1980	1990	2000	2008	2000–8 change (%)
Algeria	0.055	0.080	0.081	0.100	2.7
Egypt	0.112	0.115	0.105	0.112	0.8
Israel	0.080	0.082	0.078	0.069	−1.5
Jordan	0.121	0.207	0.195	0.154	−2.9
Lebanon	0.094	0.090	0.110	0.060	−7.3
Libya	0.134	0.274	0.121	0.106	−1.6
Morocco	0.083	0.072	0.085	0.086	0.2
Syria	0.134	0.215	0.165	0.121	−3.8
Tunisia	0.101	0.113	0.104	0.085	−2.5
Turkey	0.132	0.118	0.119	0.109	−1.1
EU-27	0.135	0.109	0.091	0.080	−1.6

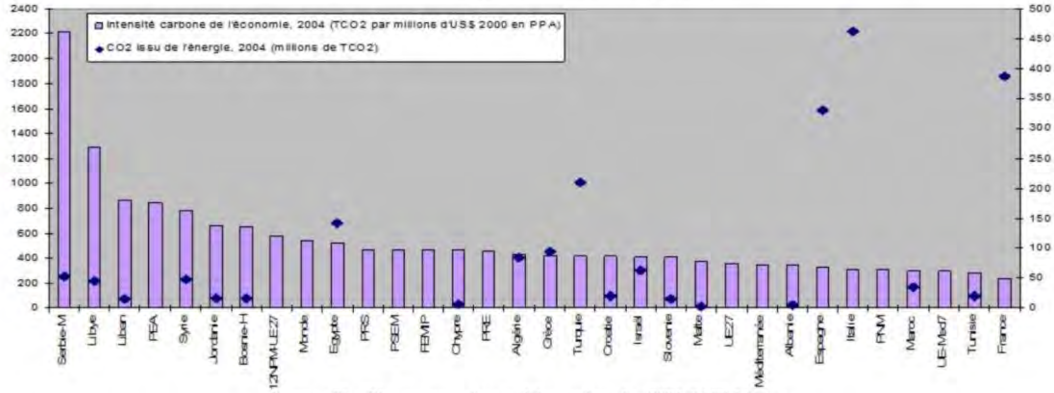
Source: Blanc (2012, p. 4) based on WEC, Enerdata—Global Energy and CO_2 Data

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

In the figure below, we can observe total carbon emission and carbon intensity of each country in the Mediterranean region in reference year 2004.

We realize that countries with highest emissions levels (such as Italy, France and Spain) also present lower carbon intensity.

Figure 10 - Absolute CO2 emissions due to energy use (right hand side scale) and carbon intensity of the economies (left hand side scale) by region and country in 2004.



Source : Plan Bleu computations and formatting after WRI CAIT 5.0 data

Source: (FEMIP 2008)

Similarly, let us consider the historical evolution of carbon intensity in some countries in the SEM sub-region in the period 1990 - 2019: Egypt, Morocco, Israel and Turkey. Overall, we can observe a decrease in the carbon intensity levels of these countries, with Turkey, Morocco and Egypt currently displaying values between 50 and 60 gCO2/MJ after having experienced some fluctuations. Israel, on the contrary, started from similar values and after considerable fluctuations finally stabilized between 30 and 40 gCO2/MJ. (International Energy Agency 2022)

Similar values can be observed for the European Union, although the EU did not experience the same steep fluctuations as Israel, rather following a more linear path. Figures 3.1 to 3.5 in the Annexes describe visually this historical developments.

Energy Consumption and Production

In this chapter the production (by source) and consumption (by sector) patterns of the SEM sub-region will be examined. Of course, domestic production does not match domestic consumption because energy resources are unevenly spread across the sub-region and thus SEM countries are either net importers or net exporters of energy products.

Energy Consumption

“Over the last few decades, the South and the East of the Mediterranean region has experienced a constant pace of economic growth. This trend, combined with an expanding population, has been the basis of the region’s booming energy demand. The predominant energy consuming sector is transport, followed by the residential, industry, commercial and agriculture” (FEMIP 2008). According to the figure below, in the period 1990 to 2013, the transport, commercial and agriculture sectors increased their shares, while industry and residential respectively decreased their shares (but not in absolute terms).

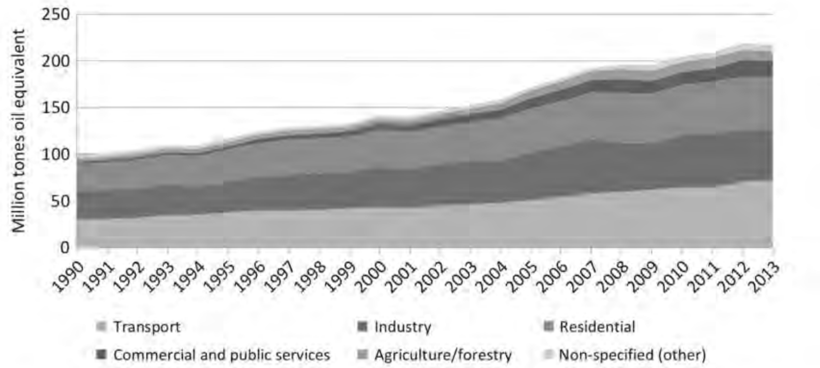


Fig. 4.4 Total final energy consumption by sector in SEMCs (1990–2013) (*Source*: Author’s elaboration on International Energy Agency, Extended World Energy Balances Database, accessed in March 2016)

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

The figure below shows the final energy consumption in SEM countries in 1990 and 2013, allowing a comparison in relative terms (percentage) between the start situation and the end situation shown in the figure above and confirming the relative reduction in industrial and residential energy consumption.

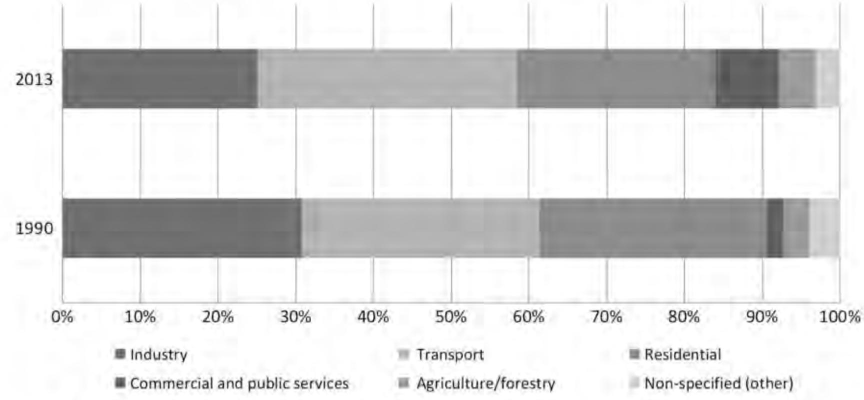
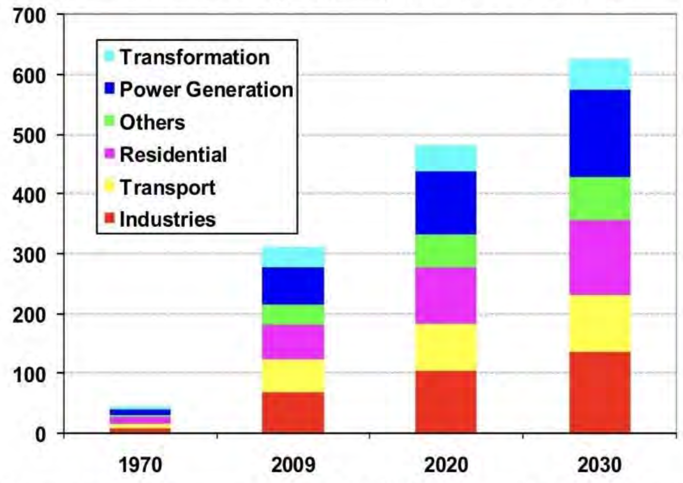


Fig. 4.5 Sectorial breakdown of the SEMCs' total final energy consumption in 1990 and 2013 (*Source*: Author's elaboration on International Energy Agency, Extended World Energy Balances Database, accessed in March 2016)

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

In the case of primary energy consumption[1] - including power generation and transformation, thus different from final energy consumption - the situation is historically a bit different as power generation has always represented a main driver of energy consumption, in particular in the form of electricity production and heat generation (both at domestic and industrial level).

Figure 2. MED-11 energy consumption by sector (Mtoe)



Source: Own elaborations for the MEDPRO Energy Reference Scenario.

(Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012)

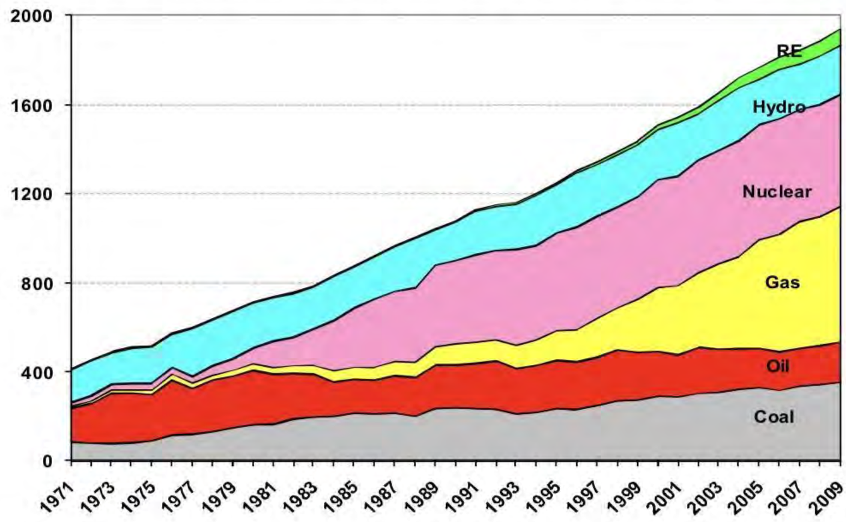
[1] Primary energy consumption corresponds to total domestic energy demand, while final energy consumption measures to what end users actually consume. The difference relates mainly to what the energy sector needs itself and to transformation and distribution losses.

A few data about electricity production and consumption: "the final consumption of electricity is concentrated in the industrial sector (38%), followed by the residential sector (36%) and the tertiary sector (25%). In addition, about 11% of the total electricity production in the SEM subregion is generated from renewable sources" (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012).

Energy Production

In the two tables below we observe the total power production trend by source in the whole Mediterranean region over the period 1971 - 2009, compared to the energy production in the SEM sub-region in 2009.

Figure 5. Power production by source in the Mediterranean (TWh)



Source: Authors' update, p. 11, El Andaloussi (2010).

Source: (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012)

As shown by the figure above he energy production in the entire Mediterranean region has increased almost fivefold over the period at stake, with a sensible growth in gas and nuclear shares, a slight increase in coal and stable levels in hydropower and oil, finally the share of renewables remains marginal.

Table 6. Power generation in the MED-11 in 2009 (TWh)

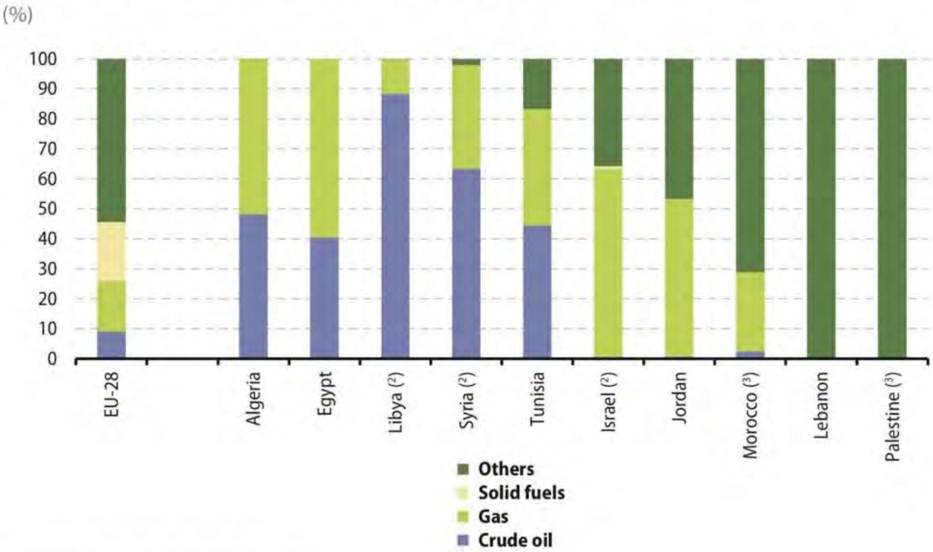
	Coal	Oil	Gas	Hydro	RE (excl. hydro)	Total	% RE + hydro	RE + hydro
Algeria	0	0,7	41,8	0,3	0,01	43	1	0,4
Egypt	0	25,8	89,6	15	1,0	131	12	15,7
Libya	0	20,7	9,8	0,0	0,1	31	0,4	0,1
Morocco	10,9	3,5	3,1	3	0,4	21	16	3,3
Tunisia	0	1,4	13,4	0,1	0,1	15	1,2	0,18
Turkey	55	6,6	94,4	36	2,2	194	20	38,0
OSE	35,4	44,2	38,8	3	0,01	122	3	3,3
MED-11	**101**	**103**	**291**	**57**	**4,0**	**556**	**11**	**61**
% Share	18	19	52	10	0,6	100	–	11

Source: Own elaborations for the MEDPRO Energy Reference Scenario.

Source: (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012)

As we observe in the table above, in 2009 in the SEM sub-region alone the picture looks different with a considerably larger share of gas. This is easily explained due to the absence of nuclear power in the energy production pattern of the sub-region, although Egypt is planning to include nuclear in their power generation mix and Turkey is expected to kick-off production in 2023. Outside the MED-11 subregion, France is the main producer of nuclear power.

Figure 10.2: Structure of primary energy production, 2013 (¹)



(¹) Ranked on the sum of crude oil and gas.
(²) 2012. Data from IEA.
(³) 2012.

Source: Eurostat (online data codes: nrg_100a and med_eg10) and the International Energy Agency (IEA)

Source: (Eurostat 2015)

As indicated in the figure above, the landscape of primary energy production in the sub-region is still very much dominated by gas and crude oil, with notable exceptions in Morocco, Lebanon and Palestine.

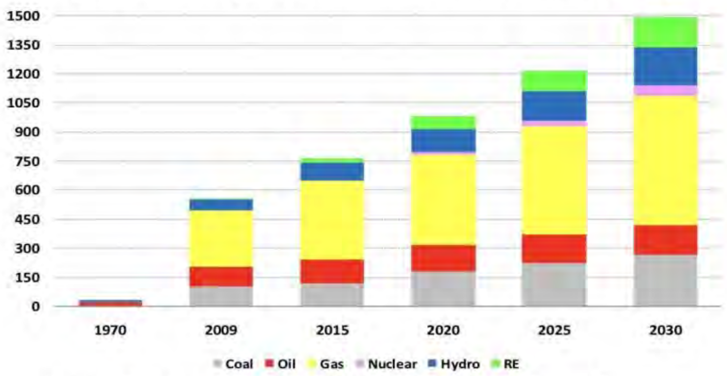
On a different note, by looking at the two figures below, it is possible to visualize the historical development and future projections of power generation by source between 1970 and 2030. We can fairly expect that the future will reserve a less dominant role for gas, due to geopolitical tensions with Russia and the related changes in the energy supply structure, though it will still play a major role in the energy mix of the region. Renewables (including hydro) are expected to grow substantially and paradoxically some countries might want to exploit the highly polluting domestic reserves of coal to reduce their dependence on external suppliers.

Table 7. MEDPRO Energy Reference Scenario for power generation in the MED-11 (2009–30) (TWh)

	2009	2015	2020	2025	2030	Additional (2009–30)
Coal	101	118	182	221	263	162
Oil	103	121	136	147	155	52
Gas	291	409	464	562	670	379
Nuclear	0	0	13	27	59	59
Hydro	57	93	118	152	196	139
RE (excluding hydro)	4	22	67	109	158	154
Electricity output (TWh)	**556**	**763**	**980**	**1218**	**1501**	**945**
of which RE+hydro	61	115	185	261	354	293

Source: Own elaborations for the MEDPRO Energy Reference Scenario.

Figure 6. MED-11 power generation by source (2009–30) (TWh)



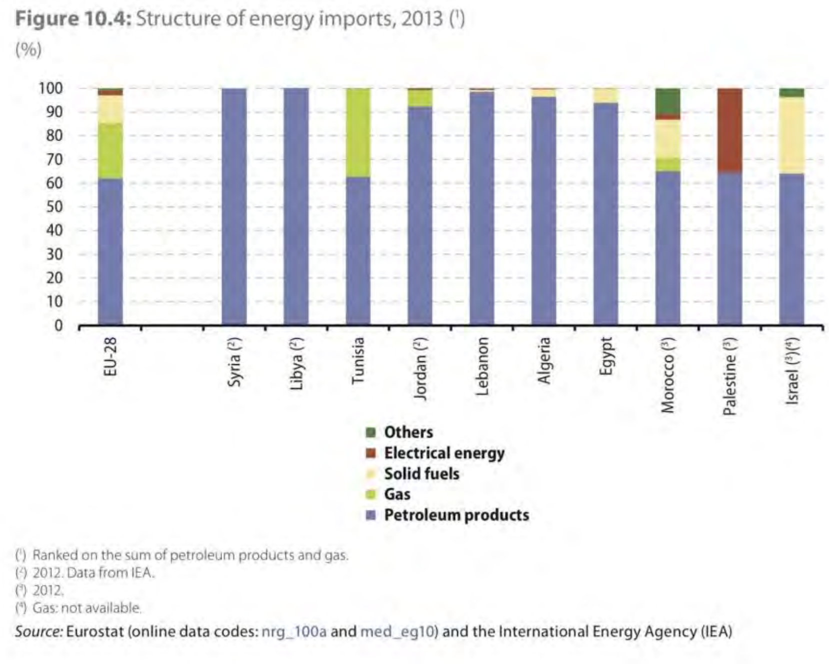
Source: Own elaborations for the MEDPRO Energy Reference Scenario.

Source: (Eurostat 2015)

Overall, it is evident that power generation in the SEM sub-region is extremely reliant on fossil fuels and the decarbonisation trend does not really seem to be well on track. The development of renewable energies in the sub-region is still in its infancy: energy transition plans are not always clear and only a few countries are seriously investing in the sector, as we will see in the next chapter.

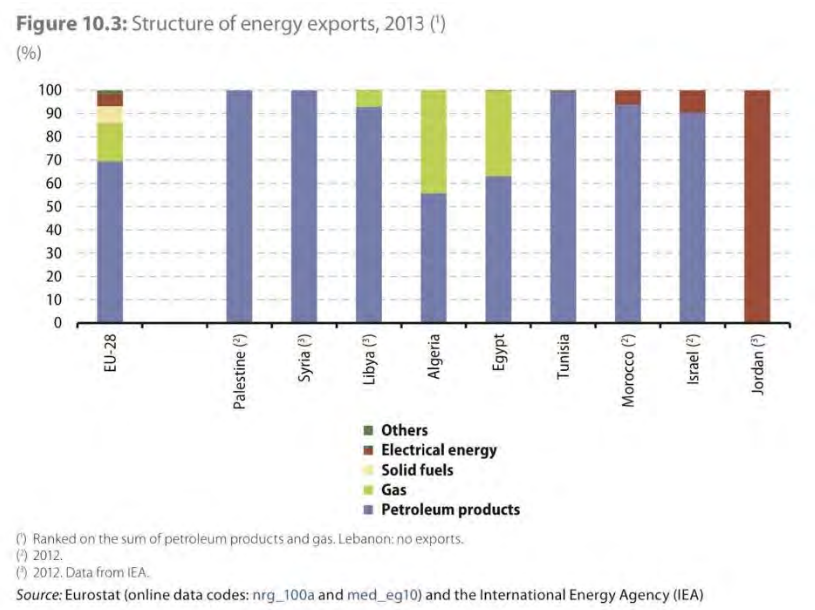
Energy Imports and Exports

"Despite the significant energy resources of Algeria, Libya and Egypt, the SEM sub-region experiences a high level of energy dependence (all countries except these three are net energy importers)" (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012). As shown in the figure below, the structure of energy imports is again dominated by petroleum products. Tunisia integrates its energy imports with considerable shares of gas, mostly from Algeria. Only Morocco, Palestine and Israel present some degree of diversification, although the majority of imports is still composed by petroleum products.



Source: (Eurostat 2015)

On the exports side we observe a very similar situation: the dominance of petroleum products, although Algeria and Egypt also export considerable shares of gas, with Jordan being the only exception uniquely exporting electrical energy.



Source: (Eurostat 2015)

Renewable Energy

Overview

The sub-region has a huge potential for renewable energy, but as demonstrated in the previous chapter, the overall energy mix is still very much carbon intensive.
However, “it is expected that in 2030 renewable energy (including hydro) will reach a market share of 24%, thus representing the second most important source of power generation after natural gas. In this context, Turkey has the largest percentage of renewable energy in the sub-region: it accounts for 42% of the total installed wind capacity of the region and 66% of the total hydropower capacity.
In absolute terms, Turkey, Algeria, Egypt and Morocco are planning the largest increases of renewable energy capacity” (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012).
“The huge potential for renewable energy holds true particularly in terms of solar and

wind energy. In fact, the sunshine duration ranges between 2,650 and 3,600 hours/year, a lot more if compared to the Central European region. In this view, the German particle physicist, Dr. Gerhard Knies, once said: within 6 hours deserts receive more energy from the sun than human- kind consumes within a year" (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017).

As for wind energy, several sites have great potential: Egypt for instance has one of the highest average wind velocities in the world. However, hydropower is the real big player in the renewable energy mix of the SEM sub-region. In fact, with the exception of hydropower, the diffusion of renewable energy in the total installed capacity of the region is still marginal.

As shown in the picture below, the total share of renewable energies in 2030 will increase substantially, up to the point where hydropower will only represent around 40% and other renewables around 60% of the total installed capacity of renewable power. By 2030, it is expected an increase in renewable energy (excluding hydro) in Turkey by 21 GW, in Algeria by 12 GW, in Egypt by 8 GW and in Morocco by 4 GW, in Tunisia and Libya by 2 GW.

Table 38. Renewable energy power plants to install by 2030 (MW)

	2009		2030		
	Hydro	**RE (excl. hydro)**	**Hydro**	**RE (excl. hydro)**	**RE additional by 2030**
Algeria	228	28	418	12002	12164
Egypt	2842	441	3071	8022	7810
Libya	0	1,5	0	2950	2949
Morocco	1748	286	2700	4260	4926
Tunisia	66	59	66	2504	2445
Turkey	14553	1017	27000	21396	32826
OSE	1176	69	3075	6473	8303
MED-11	**20613**	**1901**	**36330**	**57606**	**71422**

Source: Own elaborations for the MEDPRO Energy Reference Scenario.

Source: (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012)

Renewable Energy Plans

"When it comes to the increase of the share of renewable energies over the total energy, some countries in the sub-region do not have very ambitious targets (10% for Israel and Jordan), while others aim at significant shares of renewable energy sources

(42% for Morocco). Moreover, in many cases, it is not clear whether the targets are binding or merely indicative. Overall, there seems not to be any widely accepted mechanisms for renewable energy support, in addition to a general lack of support schemes, information and public awareness” (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012).

While SEM countries share some common objectives to promote renewable energy sources, there is also a proliferation of different national targets, strategies and approaches (in some cases designed to be compatible with the EU’s best practices). Over the last years, almost every government in the sub-region adopted its national renewable energy plan, typically including targets for electricity generation from renewable energy between 10% and 20%. As indicated in the figure below, the most ambitious targets are those set by Morocco (43% by 2020) and Turkey (30% by 2023). According to Turkish government data, as of May 2020, hydropower alone represented the largest source of electricity generation at 34%.

Table 4.3 Overall renewable energy targets in SEMCs

Country	Targets
Morocco	42% of electricity generation by 2020 of which 14% is solar, 14% is wind and 14% is hydro
Algeria	6% of electricity generation by 2015; 15% by 2020; 40% by 2030
Tunisia	11% of electricity generation by 2016; 25% by 2030 16% of installed power capacity by 2016; 40% by 2030
Libya	7% of electricity generation by 2020 and 10% by 2025
Egypt	20% of electricity generation by 2020
Israel	10% of electricity generation by 2020
Palestinian Territories	25% of primary energy by 2020 10% of electricity generation by 2020
Jordan	7% of primary energy by 2015; 10% by 2020
Lebanon	12% of electrical and thermal energy by 2020
Syria	Specific capacity targets for PV, solar heat and wind by 2030
Turkey	30% of electricity generation by 2023

Source: Author’s elaboration on UAE/IRENA/REN21 (2013) and national renewable energy plans

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

Figure 4 in the Annexes describes the solar and wind energy capacity targets by technology in the subregion, where PV stands for photovoltaic and CSP for concentrated solar power. Beside overall targets, these plans also provide specific renewable energy capacity targets by technology. “It is expected that if all targets were met, the installed solar and wind energy capacity of the sub-region could reach 75,000 MW by 2030" (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017). Again, these targets are generally not legally binding and should be taken carefully, considering that governments often use them to sponsorise their commitment to renewable energy to public opinion and international investors.

Not only governments in the sub-region have set national targets, but also have established agencies for the implementation of such renewable energy plans. "These agencies support the activities of the competent ministries and of the energy regulatory authorities in the promotion of renewable energy" (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017). Figure 5 in the Annexes provides the full list of the agencies per country.

Cooperation Projects

Effective energy cooperation between the EU and SEM countries is crucial to meet the ever-increasing energy demand of the Euro-Mediterranean region and at the same time reduce the dependency on external supplies, securing the cleanest possible and most affordable energy mix to both shores of the sea. Currently this cooperation focuses on two main dimensions: gas and renewables (especially solar but also wind and hydro), as explained in the following paragraphs.

Gas

Although gas cannot be classified as a clean source of energy, previous chapters have demonstrated the dominance of this resource in the energy mix of the region. Realistically, gas consumption will increase even more in the foreseeable future, becoming the transitional form of energy between a coal and oil past and a renewable future. For these reasons the role of gas in the Euro-Mediterranean relation cannot be ignored nor denied and therefore deserves our attention.
In 2015 the European Commission declared that an aim of EU energy policy is "to develop access to alternative gas suppliers, including [...] from the Mediterranean". (Tagliapietra and Zachmann, Energy Across the Mediterranean 2016)

Seven years later this statement became a pressing necessity, due to the almost total ban on Russian gas imports. In this regard, in March 2022 the Israeli scholar Nimrod Goren said: "Eastern Mediterranean energy sources (i.e. gas) can indeed be part of the solution to the EU's dependence on Russian supplies. But, to fulfill this potential in a way that benefits all countries, the region should become a more collaborative one, with less focus on conflicts and tensions". (Anadolu Agency 2022)

In November 2008 the European Commission delivered a Communication entitled "Second Strategic Energy Review—An EU Energy Security and Solidarity Action Plan", the document defined the Southern Gas Corridor (SGC) as one of the EU's highest energy security priorities. (European Commission 2008)
"The project had the ambitious objective of securing the supply of gas and the construction of the pipelines from Central Asia, across the Mashreq, Anatolia and the Balkans up to Central Europe. The project immediately received the support of the EU, USA and Turkey. Beside the energy diversification for the EU and the loss of control by Russia on European energy supplies at the eyes of the Americans, it also accomplished the strategic objective for Turkey of becoming a key energy corridor between the East and the West (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017). However, the original idea of a multilateral and large-scale project based on a variety of gas supply sources (Nabucco), turned out to be a bilateral and medium-scale project with only one supply source, Azerbaijan (TANAP)" (Tagliapietra and Zachmann, Energy Across the Mediterranean 2016).

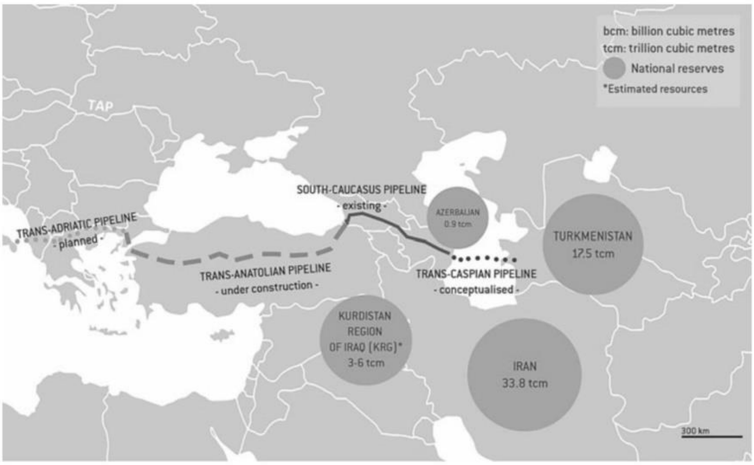


Fig. 3.20 The "final" shape of the Southern Gas Corridor: TANAP and TAP (*Source*: Bruegel)

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

Renewables

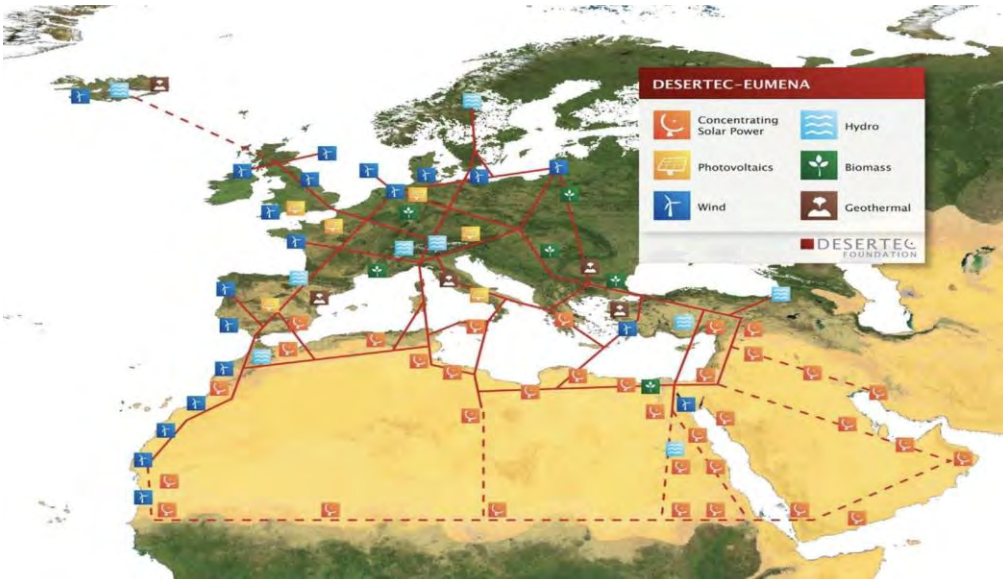
Producing energy from renewable energy sources is crucial for reducing GHG emissions, beside improving the efficiency of how this energy is used.
This might sound odd but the most important step to decarbonise our economy, though the most complex one, is the switch from fossil fuels to renewables.
As explained in the previous chapter, every SEM country has included the increase in installed capacity of solar power generation in their national strategies. For instance, Morocco is currently building the fourth solar plant in the solar district of Ouarzazate, one of the biggest in the world.[2] <

However, in the optic of energy cooperation, producing energy is not enough. Two additional elements are necessary to complete the foundations of fair and reliable cooperation aimed at a broad deployment of renewable energy in the region: the development of an electricity market (able to support the exchange of high volumes)

[2] "Ouarzazate Solar Power Station, also called Noor Power Station is a solar power complex and auxiliary diesel fuel system. At 510 MW, it is the world's largest concentrated solar power (CSP) plant. The project received preferential financing from several sources including the Clean Technology Fund, African Development Bank, the World Bank, and the European Investment Bank; the EIB has loaned over 300 million euros to the project."
Source: (Wikipedia 2018)

and an efficient system of interconnections, framing the whole region into a single market.

“In 2003, an international group of scientists, experts and politicians launched the Trans-Mediterranean Renewable Energy Cooperation (TREC). The TREC project proposed a solution by which Europe would buy high volumes of solar and wind energy produced in SEM and Mashreq countries and imported via infrastructures built across the Mediterranean, as shown in the picture below. This project was later named Desertec and presented in 2007 to the European Parliament.
Within a few years, the original focus shifted from bringing energy from SEM countries to Europe, to the development of integrated markets encouraging the advantages of renewable energy. However the original impetus quickly got lost and the Arab Springs made the rest: in 2014 most of the members of the consortium abandoned the project, marking the end of Desertec” (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017).



Source: (Desertec Foundation n.d.)

"After Desertec, other initiatives have emerged in the region, such the Mediterranean Solar Plan (MSP), MEDGRID and RES4MED, among others. For instance, the Mediterranean Solar Plan (MSP) launched in 2008, is one of the top priorities of the Union for the Mediterranean (UfM). The project was inspired by the vision that: Europe had built around coal and steel, and now both shores of the Mediterranean had to do so around water and sun" (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012).

The MSP project, supported by the European Commission, aimed to export solar and wind power to Europe, implying some degree of synergy with Desertec. In 2013, the UfM presented a new MSP roadmap. However, the UfM energy ministers did not support the new plan, de facto dismantling the MSP.

"Some scholars argue that Desertec and the MSP failed because of lack of realism, both economically (high costs and insufficient infrastructures) and politically (focus on European demand instead of SEM demand)". (Tagliapietra and Zachmann, Energy Across the Mediterranean 2016)

"Under the UfM umbrella countries share a platform to facilitate and promote regional dialogue and cooperation as well as concrete projects and initiatives in the fields of energy and climate change challenges. The UfM Gas Platform, UfM Regional Electricity Market Platform and the UfM Renewable Energy and Energy Efficiency Platform are notable examples of cooperation fora in the region. These platforms aim at supporting partnerships based on mutual trust and transparency between UfM member states as well as with the relevant energy stakeholders in the region" (Union for the Mediterranean Secretariat 2015).

On a different notice, "MedReg and Med-TSO are respectively, the associations of the Mediterranean regulatory agencies and of the Mediterranean transmission system operators. Both organizations are supported by the EU and aim to foster energy cooperation in the Mediterranean region" (Sartori, Colantoni, et al. 2017).

In conclusion, SEM countries experienced tremendous changes in the last decades and the EU has been too slow in adapting its energy policy toward the region.

The multilateral approach implemented by the EU in the unstable and low-integration context of SEM countries is probably one of the factors that undermined the vision of a unique Euro-Mediterranean energy community. However, the energy cooperation in the Mediterranean is an historical step toward the integration of this region that will gain new momentum thanks to the energy transition needs and the geopolitical tensions with Russia, both in terms of renewable energies and fossil fuels.

Section 3

Introduction

The previous two sestions provided an overview of the EU Climate Policy and the situation in the Mediterranean, let us now try to connect the dots by considering the effects of a specific EU policy (CBAM) on a specific SEM country (Turkey).
In this section, in fact, we will consider the case study of Turkey, in order to explore the reach of EU climate policy beyond its nominal borders, in the Mediterranean region. The case of Turkey is particularly interesting as the country finds itself in a very special position, representing a unique kind of partnership with the EU.
The relations between EU and Turkey historically proved to be very tight, although they are subject to the influence of internal and external factors of different character. Turkey is not just a third country for Europe: it has been a member of NATO since 1952 and acts as a strategic buffer between Europe and the Middle East, the Caucasus and Central Asia.

The modern Turkish state is bound to the European Union through cultural ties, cooperation projects and, notably, the Customs Union. In addition, Turkey is a candidate for EU membership (however the application is being considerably slowed down after the 2015 attempted coup) and a member of the EU Southern Neighbourhood (the only one with accession prospects). "Given that the EU is currently unable to offer a credible prospect of membership, anchoring the Turkish economy in Europe is the best tool available to influence the country towards greater democracy, human rights rights and a liberal, rules-based market economy." (Hakura 2018)

As we will see, the Turkish economy is heavily relying on industrial exports to the EU, thus making it very much vulnerable to the EU Trade Policy. Not only the European trade policy is able to affect the Turkish economy, but also "many clients of Turkish banks are somehow exposed to the prices of emission allowances traded under the EU ETS. Now, with the upcoming entry into force of CBAM" (Climate Focus 2021), many

Turkish industrial sectors will incur in the effects of such a policy, with the concrete risk of market share contraction due to loss of competitiveness vis-a-vis European firms.

The Turkish government is slowly adapting its climate ambitions to western standards and finally ratified the Paris Agreement. It is also planning the introduction of a carbon pricing measure in order to shield Turkish enterprises from CBAM and generate revenue for the State.

The energy mix of the country is still very much reliant on gas, mainly from Russia and the Caucasus (Azerbaijan). However, given the recent tensions with Russia, Turkey might consider to reduce the dependency on Russian gas by exploiting the domestic reserves of coal (high emissions). Hydropower is a major source of electricity, destined to grow alongside other renewables such as solar and wind.

In this chapter, after outlining the commercial relations between Turkey and the EU bloc, we will look inside the climate policies of the country and the energy and emissions profile, and finally look into the implications of CBAM for Turkey.

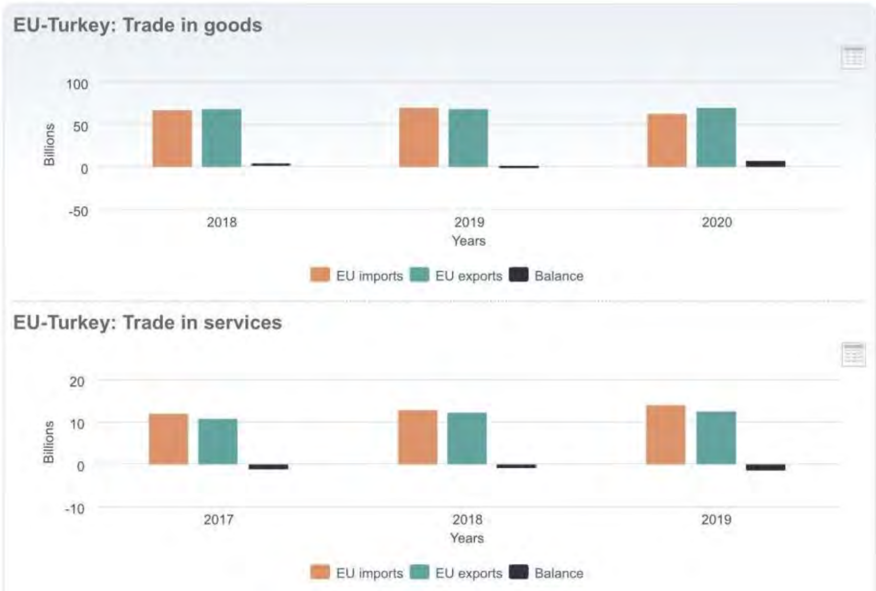
Customs Union

The Current Customs Union

“In 1963, Turkey signed an association agreement with the EEC, known as the Ankara Agreement. The final phase of EC-Turkey relations under the Ankara Agreement was to achieve the EC-Turkey Customs Union (CU)” (Delegation of the European Union to Turkey n.d.). This last phase entered into force on 1 July 1996: it was the first substantial customs union of the EU with a third country.
“Within the framework of the Customs Union, Turkey has adopted the Common External Tariff (CET) of the European Union for most industrial products and industrial components of agricultural products, but the CU does not cover agriculture, services or public procurement. The parties also eliminated all customs duties, quantitative restrictions and charges on their bilateral trade” (World Bank 2014).

“In addition, bilateral trade concessions apply to agricultural products, coal and steel. For example, for ECSC (coal and steel) products, Turkey signed a Free Trade Agreement (FTA) with the EU in July 1996 and therefore ECSC products have enjoyed duty-free treatment between the parties since 1999” (World Bank 2014).

“Currently, Turkey is the EU's sixth largest trading partner, accounting for 3.6% of total EU merchandise trade with the world in 2020 and the EU is by far Turkey's largest import and export partner, as well as its main source of investment. Notably, in 2020, 33.4% of Turkey's imports came from the EU and 41.3% of the country's exports were destined for the EU” (European Commission 2020).
These data confirm the extreme interdependency between the two entities and the absolute necessity of harmonised policies in different fields.



Source: (European Commission 2020)

Prospects for Modernization

It is important to note that under the status quo, Turkey cannot participate in the formation of the common trade policy of the EU. This means that third countries with which the EU has concluded FTAs sometimes refuse to conclude FTAs with Turkey. Consequently, Turkish companies do not benefit from automatic mutual access to these markets, while imports from these countries can enter Turkey duty-free by

diversion of trade via the EU. As explained, despite the CU contributions to EU-Turkey economic integration, during its 20 years of existence, it has become obsolete. An unprecedented increase in world trade, the eastward enlargement of the European Union and the growing influence of emerging economies have also changed the landscape in which the CU operates.
In December 2016, the Commission proposed to modernize the CU and extend bilateral trade relations to areas such as services, public procurement and sustainable development. However, the Council has not yet adopted the mandate.

The inclusion of sustainable development products would certainly mark a decisive step in the direction of a deeper climate cooperation in the Mediterranean, unlocking potential for the development of green technologies and best practices in the region.

In conclusion, we can argue that trade integration between the EU and Turkey has increased considerably over the past two decades. However, like the EU, Turkey's trade relations are changing. A lesson that can be drawn from the Turkish experience is that "trade liberalization achieved through a preferential trade agreement such as the EU-Turkey Customs Union can successfully transition the economy from a regime controlled by the government to a market-based regime". (Togan 2012)
Other SEM countries may not have the prospect of joining the EU, but these countries may still be interested in integrating into the EU in order to achieve relatively high but sustainable economic growth.

Emissions Profile

We have observed that trade relations between Turkey and the EU are substantial and created a *de facto* interdependence between the two blocs. Let us now look into the emissions profile of Turkey in order to spot the vulnerabilities raised by the EU climate policy and CBAM in particular.
In a historical perspective, since the industrial revolution, Turkey has been responsible for only 0.7% of global GHG emissions. However, the rapid development of the country caused an increase in GHG emissions across all economic sectors, leading "Turkey to

become the 17th largest emitter of greenhouse gases in the world” (Daily Sabah 2022). Unsurprisingly, the country is being hit by the effects of climate change, such as heat waves, droughts and floods.

In the figure below, we can have a look to the overall evolution of GHG emissions by sector in Turkey during the period 1990 - 2018. It is possible to observe a 161% increase in total GHG emissions across the reference period, mainly due to the energy sector. In absolute terms, in 2018, Turkey emitted a total of 520.9 Mt GHG emissions to the atmosphere - or 428 Mt of GHG excluding LULUCF negative emissions - distributed by sector as follow: energy (71.6%), agriculture (12.5%), industry (12.5%), waste (3.4%). (International Energy Agency 2021)

Figure 3.1 Greenhouse gas emissions by sector, Turkey, 1990-2018

Total GHG emissions in Turkey have rapidly increased in recent decades, posting a growth rate of 161% since 1990 (including LULUCF), mainly driven by the energy sector.

* *Energy* includes power and heat generation, commercial, households, industrial energy consumption, and transport, and excludes indirect CO_2.

** LULUCF includes changes to emissions based on land-use, land-use change and forestry.

Note: Mt CO_2-eq = million tonnes carbon dioxide equivalent.

Source: Turkish Statistical Institute (2020), *Turkish Greenhouse Gas Inventory 1990-2019*, https://unfccc.int/documents/223580.

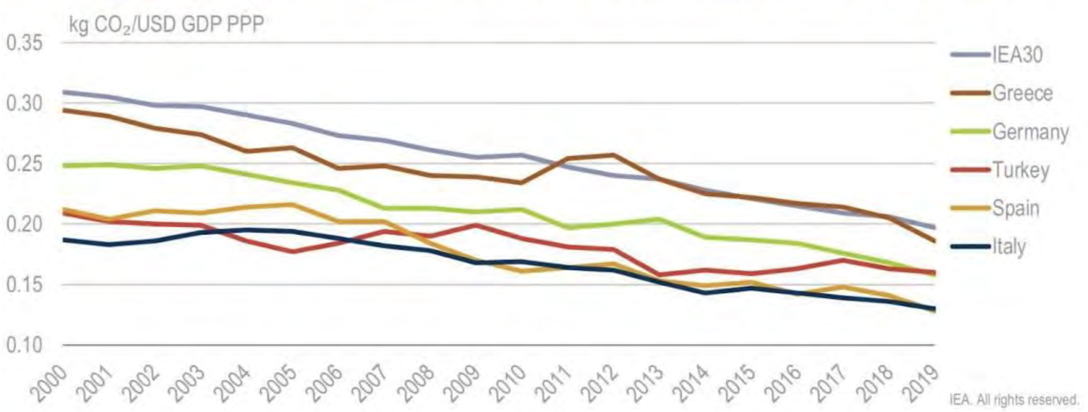
Source: (International Energy Agency 2021)

As explained in the previous section, carbon emissions are usually driven by population growth and economic development, however also energy intensity of the economy and carbon intensity of the energy supply play an important role in this context.

In the period 2000 - 2018, the GDP per capita increased by 88% and the population grew by 27%.

As we can observe in the figure below, the carbon intensity of the energy supply did not experience major fluctuations and the energy intensity of the economy has decreased slightly. These two factors combined caused CO2 emissions to increase by 86% between 2000 and 2018.

Figure 3.6 CO_2 intensity per GDP in selected IEA member countries, 2000-19



The carbon intensity of Turkey's economy has declined at a slower pace compared to many other IEA countries, with a 23% drop from 2000 to 2019.

Notes: kg CO_2 = kilogramme of carbon dioxide. Data for 2019 are estimates.
Source: IEA (2020), *CO_2 Emissions from Fuel Combustion 2020*, www.iea.org/statistics.

Source: (International Energy Agency 2021)

"One of the vulnerabilities of the country's exporting sectors is the high carbon intensity of the electricity production. In fact, it is estimated that scope 2 emissions (7.7 Mt) embedded in EU28 exports accounts for 21.3% of the total emissions" (Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy 2021).
This aspect is particularly important when it comes to assessing the impact of carbon border adjustment measures such as CBAM.

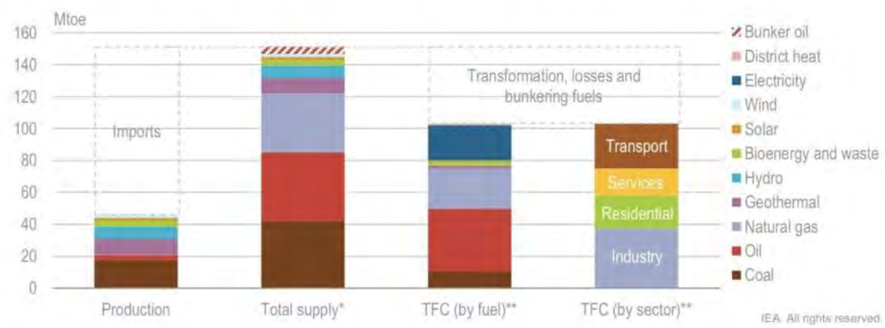
Energy Profile

Energy Consumption

The figure below gives a comprehensive overview of the energy profile of the country, with about two thirds of energy supplies coming from imports.

"We can observe how Turkey's energy is still largely dependent on fossil fuels, accounting for 83% of the total primary energy supply in 2019 and 73% of total final in 2018. The industry is the sector that consumes the largest share of energy (over a third of final energy consumption in 2018) followed by transport (27%), residential (20%) and services (17%)" (International Energy Agency 2021).

Figure 2.2 Overview of Turkey's energy system by fuel and sector, 2018/19



Fossil fuels dominate the energy supply in Turkey, accounting for 83% of TPES in 2019, with roughly equal shares of coal, oil and natural gas, and 73% of TFC in 2018.

* Total supply includes total primary energy supply plus international bunker fuels.

** TFC data are from 2018.

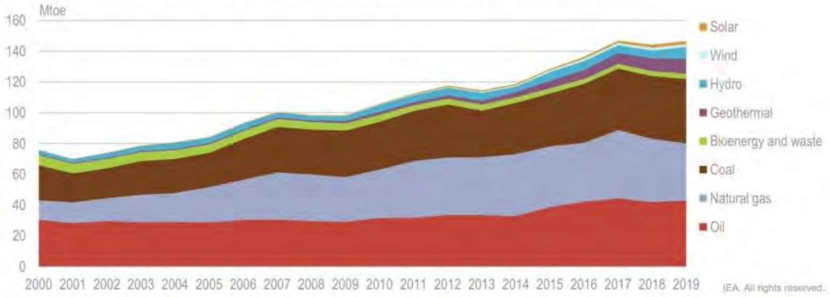
Notes: Mtoe = million tonnes of oil equivalent. TFC = total final consumption. Production and total supply data for 2019 are provisional.

Source: IEA (2020), *IEA World Energy Statistics and Balances* (database), www.iea.org/statistics.

Source: (International Energy Agency 2021)

As explained in the figure below, primary energy supply (equal to total primary energy supply excluding international bunker fuels), increased by 92% in the last two decades, mostly driven by increasing shares of fossil, though renewables also grew.

Figure 2.3 Total primary energy supply by source, Turkey, 2000-19



Energy supply in Turkey has increased by 92% since 2000, most of which consists of fossil fuels, despite a growing supply of renewables over the last decade.

Notes: Mtoe = million tonnes of oil equivalent. Supply data for 2019 are provisional. Electricity imports and exports are not shown in the chart.
Source: IEA (2020), *IEA World Energy Statistics and Balances* (database), www.iea.org/statistics.

Source: (International Energy Agency 2021)

In the figure below it is possible to observe the final energy consumption by source for each sector, with industry presenting a very heterogenous composition (in line with other sectors) and transport being the most notable exception (97% relying on oil). Overall, fossil fuels dominate the energy mix of each sector.

Figure 2.8 Total final consumption by source and sector, Turkey, 2018

Most of Turkey's energy demand is met by fossil fuels across all sectors, while electricity accounts for considerable shares as the third-largest energy source in Turkey.

* *Industry* includes non-energy consumption.
** *Services/others* includes commercial and public services, agriculture, and forestry.
*** *Other renewables* includes geothermal and solar thermal.
Source: IEA (2020), *IEA World Energy Statistics and Balances* (database), www.iea.org/statistics.

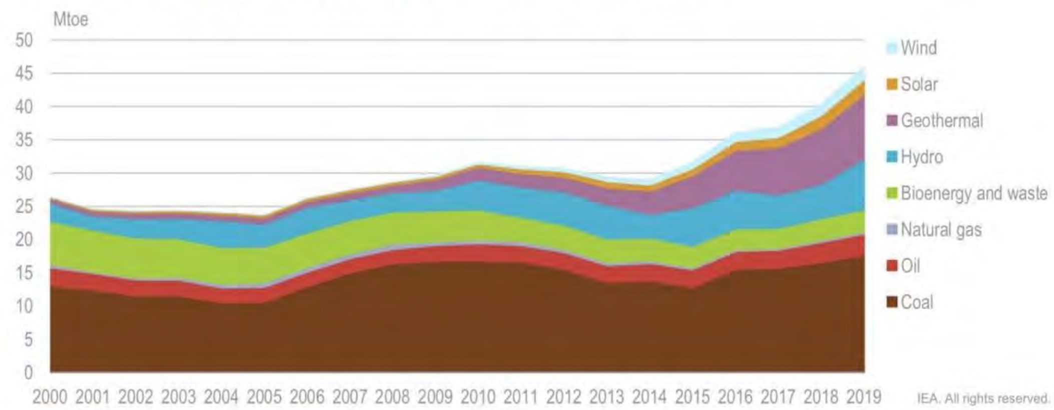
Source: (International Energy Agency 2021)

Energy Production

"In order to reduce dependency from external suppliers, domestic energy production increased rapidly, with a growth of 59% between 2014 and 2019. Such an increase was mostly due to larger shares of renewables, accounting for 54% of total energy production in 2019. However, coal still represents the main source of energy production, followed by geothermal and hydro” (International Energy Agency 2021).

In fact, Turkey has large coal reserves and coal production accounts for 42% of total domestic energy production. However, although the share of coal in energy production has been stable, the share in total final consumption has declined, while the share in primary consumption (in terms of power generation) has increased.

Figure 2.5 Energy production by source, Turkey, 2000-19



Domestic energy production in Turkey increased by 59% between 2014 and 2019, mainly driven by the expansion of renewables and coal.

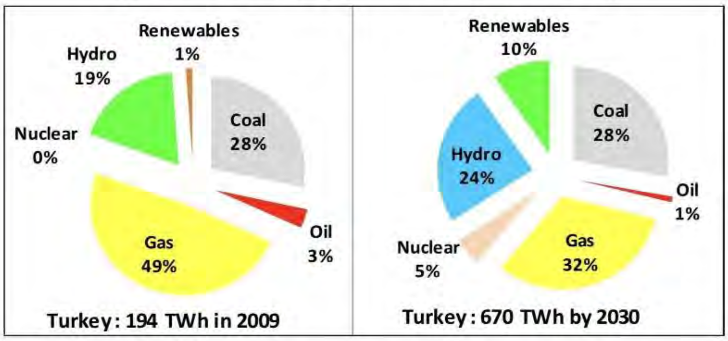
Notes: Mtoe = million tonnes of oil equivalent. Energy production data for 2019 are provisional.
Source: IEA (2020), *IEA World Energy Statistics and Balances* (database), www.iea.org/statistics.

Source: (International Energy Agency 2021)

“It is expected that by 2030 the country will implement a diversification path in the power generation mix: fossil fuels will decrease to 61% (32% gas / 28% coal), renewables will increase to 34% (24% hydro / 10% other) and nuclear power will reach 5% (Akkuyu nuclear plant)” (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012).

The picture below shows the evolution of power generation in the period 2009 - 2030, forecasting a sensible reduction in gas, the development of renewables (as we will see more in detail in the next paragraph) and the inclusion of nuclear energy in the power generation mix.

Figure 27. Electricity generation mix in Turkey



Source: Own elaborations for the MEDPRO Energy Reference Scenario.

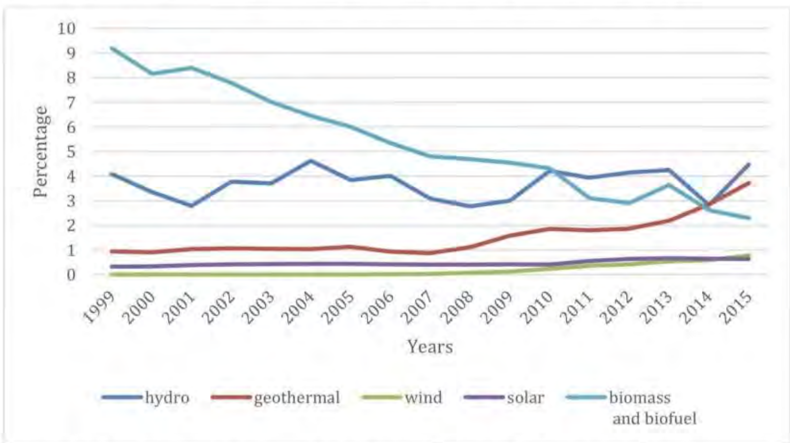
Source: (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012)

Renewable Energy

Turkey is heavily dependent on imported oil and gas, thus renewable energies are a key element of the country's strategy both in terms of energy security (achievement of energy independence) and climate change mitigation.

The share of renewables in power generation in Turkey in 2009 was 20% (1% excluding hydro). In the figure below, however, we can observe how the total share of renewables in total primary energy supply has slightly declined over the period 1999 - 2015 (mainly due to a decrease in the use of biomass and biofuel), although in absolute terms the supply of renewables has increased.

Figure 2.4 – Share of renewable energy in total primary energy supply (%)



Source: Data from the General Directorate of Energy Affairs of the Republic of Turkey, *Energy Balance Tables*. Compiled, calculated and graphed by Dicle Korkmaz Temel.

Source: (Sartori, Colantoni, et al. 2017)

"Turkey has the largest percentage of renewable energy in the SEM sub-region: it accounts for 42% of the total installed wind capacity and 66% of the total hydropower capacity. If the government respects its commitments, renewables should rise up to 34% (10% excluding hydro) by 2030, as explained in the previous paragraph" (Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib; 2012).
The share of hydro in Turkey's installed capacity was around 40% at the beginning of the 2000s and then decreased until 2010, when it peaked down to 32%. However, over the last decades the government implemented an impressive hydroelectric power plant park, with the target of exploiting the country's full hydroelectric potential by 2030.

In addition, Turkey has high potential for solar, wind and geothermal energy resources, although investments are mainly directed to wind and geothermal, while those in solar remain minimal. However, the country is still far from realizing its potential in renewables, especially in the case of wind, despite the increase in installed capacity. For example, "the technical potential in terms of wind power is about 83,000 MW but the country's installed capacity for wind meets less than 10% of its potential.
In the case of geothermal energy, the figure is even lower, around 2%" (Sartori, Colantoni, et al. 2017). On the bright side, good progress was registered in 2009, when the government launched three large tenders in photovoltaics and onshore and offshore wind energy generation.

Climate Policy

Overview

Fighting Climate Change is global joint effort and no actor can be taken seriously if not participating in the international platforms, especially under the United Nations' flag. Turkey has been part of the UNFCCC since 2004 and joined the Kyoto Protocol in 2009. In 2015, Turkey committed to Europe and adopted the 2030 Agenda for Sustainable Development at the United Nations, reflecting the political will to bring new impetus in the areas of environmental protection and GHG emissions control.

The recurrence of extreme weather events on the national territory pushed the government to adopt the first Climate Change Strategy in 2010, supported by the National Action Plan in 2011. About this Strategy, "the Ministry of Environment and Urbanization declared that Turkey will carry out these mitigation activities, in a measurable, reportable and verifiable manner, in accordance with its national programs and strategies" (Republic of Turkey 2009).

On a different note, a law adopted in 2016 requires factories to report their CO2 emissions to the Ministry of the Environment and Urbanisation. In addition, "Turkey aims to reach net zero by 2053, as announced by President Erdoğan in September 2021. Apparently, the target will cover all GHG emissions and all sectors of the economy. However, no details on the specific planning process for the net zero target is available, though the Presidency made a general reference to constant preparation and implementation of medium and long-term policies" (Climate Action Tracker 2021).

"Despite these commitments, Climate Tracker rated the climate policy of Turkey as "critically insufficient" in October 2021. In fact, these policies are not always consistent with the targets laid down in the Paris Agreement. Under the current policies, emissions will increase and are rather more consistent with a +4°global warming scenario. Climate Tracker reports that the country needs more ambitious targets for GHG emissions reduction and should develop carbon-tackling policies, in order to get a better score" (Climate Action Tracker 2021)

Intended Nationally Determined Contribution

Turkey's submitted to the United Nations Framework Convention on Climate Change (UNFCCC) its Intended Nationally Determined Contribution (INDC) i.e. the Paris Agreement target, committing the country to a reduction in emissions up to 21% by 2030, compared to a business-as-usual (BAU) scenario. (Republic of Turkey 2016) However, the economy and population will grow in the coming years, driving up the demand for energy. Thus, the country adopted a BAU baseline for emissions targets, allowing for expansions from current levels. In other words, the current target still allows emissions growth (excluding LULUCF emissions) of up to 80% above 2018 levels.

Interestingly, Turkey signed the Paris Agreement in 2016, but only ratified it in 2021. The ratification has been delayed in order to be considered as a developing country and benefit from the Green Climate Fund (the UN financial mechanism to support the most vulnerable countries). In addition, it is worth mentioning that "a Franco-German guarantee of $3.2 billion in financial support for Turkey proved decisive to speed up the ratification of the Paris Agreement and the establishment of a net zero emissions target for the year 2053" (Weise 2021).

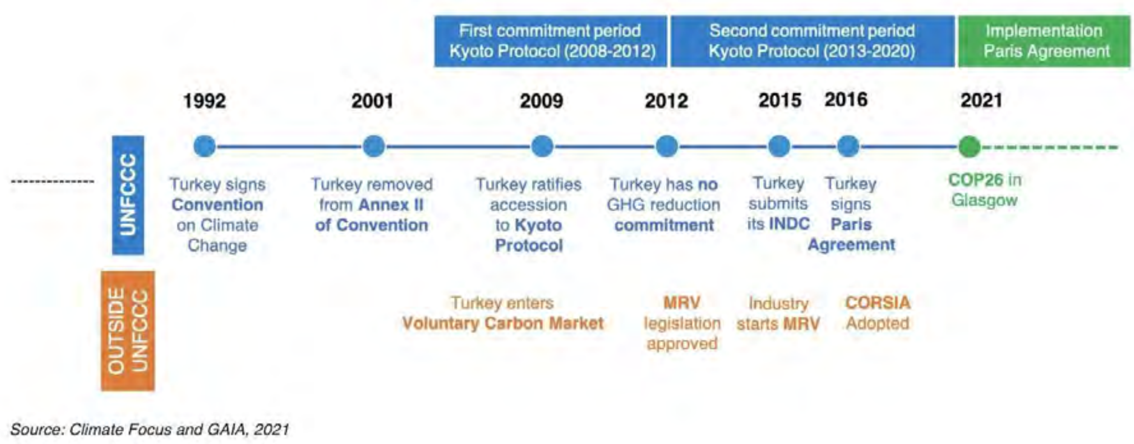
Finally, in order to achieve the 2030 mitigation target in a cost effective way, Turkey also claimed that it will make use of carbon credits from international markets, in compliance with the relevant jurisprudence. Such a method allows us to introduce the next chapter paragraph about carbon pricing in Turkey.

Carbon Pricing

"Carbon pricing and carbon markets could be crucial policy tools to support Turkey meeting its climate goals (in particular its INDC target) in a cost-effective way. Currently, Turkey does not have an emissions pricing strategy via a carbon tax or an emissions trading scheme. Nevertheless, Turkey is attempting to establish the legal infrastructure for a monitoring, reporting and verification (MRV) system in line with the EU Emissions Trading Scheme (EU ETS), motivated by the perspective of membership to the European Union" (Atil Aşıci and Acar, Towards a Green Deal in Turkey: Potentials of EU-Turkey cooperation on the green transition 2021). According to Dr Ahmet Atil Aşıci Turkey is ready to price carbon and this is the intention of the government as well. Accordingly, we can expect officials to announce an emission trading scheme before 2023, complementing the already existing MRV system.

Although in Turkey CO2 trading is not being implemented yet, some related solutions are currently under discussion. In fact, the Ministry of Environment and Urbanization is considering the establishment of an emissions trading system (preferably linked to EU ETS) in the near future. Putting a price on carbon would be an attempt to respond to CBAM, before it will come into effect in 2023 (with a transition period until 2026).

Given the country's high exposure to CBAM (the fifth most exposed country) due to the cement, iron, steel, aluminum, and electricity exports to the EU, the introduction of a carbon price could avoid the market loss due to the CO2 tax on CBAM products. Beside limiting market losses, the acceleration in the establishment of a comprehensive emission trading system, will also help generate additional revenues. In fact, by developing a wide-ranging domestic carbon pricing policy - rather than joining the EU ETS or passively accepting CBAM - Turkey could retain the revenues of such carbon pricing (estimated between 1.1 to 1.8 billion Euros), as a contribution to the national budget. In addition, "the World Bank's Partnership for Market Readiness (PMR), is supporting Turkey with the development of a national ETS" (Climate Focus 2021). In the figure below, we can observe a timeline of Turkey's climate commitments under the UNFCCC umbrella and the introduction of other sectoral carbon-related initiatives.



Source: (Climate Focus 2021)

Complementary Decarbonisation Strategies

Turkey's path to decarbonisation, beside increasing the share of renewables and the full exploitation of the hydroelectric potential (as explained in the previous chapter), also includes the commissioning of at least one nuclear power plant, the reduction of electricity transmission losses and the development of carbon capture, usage and storage (CCUS) techniques.

Starting with nuclear power generation, the Strategic Plan 2015-2019 sets the target of diversifying electricity production via the integration of nuclear energy.
On one hand, "Turkey approved in 2010 an agreement with Russia for the construction of the first nuclear power plant in Akkuyu, a town in the Mersin province along the shores of the Mediterranean: the first reactor is expected to start generating electricity in 2023. However, many fear that this project will make Turkey even more dependent on Russia in meeting its rising energy demand" (Sartori, Colantoni, et al. 2017).
On the other hand, there are talks going on to build a second and third reactor respectively with Japan and China.
The installation of nuclear power plants brings some challenges, such as the seismic risks, the problem of radioactive waste storage, the possibility of leakages, the environmental threats to marine life and the security challenge in a country crossed by geopolitical tension, among the others.

"According to the Turkish leadership, energy efficiency is an area that complements its national strategic goals. In this context, the Energy Efficiency Law adopted in 2007 and the Energy Efficiency Strategy issued in 2012, started a new transformation process and set energy efficiency goals for 2023. The action plan for the period of 2017-2023, aims at reducing the primary energy consumption of the country by 14% by 2023 through 55 actions defined in six categories: buildings and services; energy; transport; industry and technology; agriculture; and cross-cutting areas" (International Energy Agency 2021)

Considering the important coal reserves of the country and the still relevant shares of gas, the government and private business might opt for the implementation of CCUS technologies and practices. However, the fact that domestic coal production is mainly lignite (low power generation potential) and many of the power plants operate on hard coal implies that domestic coal production is not compatible with the energy security targets and reserves might remain under-exploited. (Atil Aşıci, 12th Conference on Green Economy 2022)
On one hand, when it comes to natural carbon sinks, Turkey has been working on

reforestation and afforestation projects for almost two decades, with the aim of preserving its vulnerable soils from erosion and desertification. Turkey plans to reach 7 billion newly planted trees by the end of 2023, increasing the share of forests to one third of Turkey's land area.

On the other hand, the viability of CCUS technologies in Turkey can be improved by developing pilot projects in proximity of geothermal or coal power plants, allowing for carbon usage (CU) and carbon storage (CS).

Green Deal Action Plan

Overall, we can state that Turkey is very receptive toward EU policy making, in virtue of its special position vis-a-vis the Union. The possible costs of the EGD for the Turkish economy have been first analysed by the Turkish Business Association (TUSIAD), highlighting CBAM and the Circular Economy Action Plan (CEAP) as elements that could negatively affect Turkish exports to the EU market (Atil Aşıci and Acar, Towards a Green Deal in Turkey: Potentials of EU-Turkey cooperation on the green transition 2021).
As there are very few studies on the impact of CEAP, we focus on the impact of CBAM.

Because of the many implications of the European Green Deal on Turkey, the country has developed its own National Green Deal Action Plan, in order to respond timely and effectively to the challenges presented by this legislative milestone.
The Action Plan is a roadmap for the development of green transition policies in all domains. It is also meant to support enterprises to embark in environment friendly efforts with training, loans at favorable conditions and sustainability projects.
The Action Plan's final goal is to prepare the Turkish economy and society to be compliant with the European Green Deal: it is composed of nine main headings, among these there is a detailed roadmap on how to address the Carbon Border Adjustment measure such as the CBAM. In the heading about CBAM, it is explored the possibility for a third country to be fully integrated into the EU ETS or, alternatively, the signature of a bilateral agreement linking different emissions trading systems, thus introducing the possibility of carbon pricing exemption, as to avoid double taxation.

In addition, it investigates the possibility of ensuring that carbon pricing mechanisms are taken into account when the EU concludes a FTA with a third country.

In this context, the Action Plan considers essential for Turkey to protect the rights arising from bilateral and international agreements, especially the Customs Union with the EU, the Turkey-ECSC FTA and the Association Council Decision No. 1/98. Overall, the identified priority is that CBAM does not result in a trade barrier between Turkey and the EU. The Action Plan lays down, on one hand, diplomatic actions for the effective protection of the country's interests, on the other hand, steps to be taken in line with the EU to avoid that CBAM harms the integration with the EU under the Customs Union. It also points at the study and evaluation of CBAM, in order to limit the negative effects on Turkey-EU trade relations, including the effects on Turkish energy-intensive and resource-intensive sectors. In addition, it is aimed to determine the steps to be taken by relevant institutions and organizations and NGOs in order to support the reduction of GHG emissions in relevant industrial sectors that may be subject to CBAM. The Action Plan also acknowledges that an increasing number of countries are implementing national carbon pricing mechanisms as effective tools in the fight against climate change in the world. In this direction, it is also aimed at carrying out studies on the methodology to issue certifications compatible with the EU requirements, in order to avoid additional bureaucratic and financial obstacles for businesses, while developing a monitoring system of GHG emissions originating from industry.
Moreover, the Action Plan aims at modeling the effects of CBAM on Turkish energy-intensive and resource-intensive sectors on the basis of different and scenarios sector-by-sector analysis and it will support the development of a roadmap to determine the steps for the reduction of GHG emissions in the industrial sector.
Finally, it will be the baseline for further studies to determine additional costs that will occur on the sectors and eventually develop financial support mechanisms.
The figure below provides a summary of the actions to address CBAM listed under the Action Plan (Republic of Turkey 2021).

TABLE A1. EUROPEAN GREEN DEAL ACTION PLAN (EGDAP) OF THE MINISTRY OF TRADE (JULY 15TH, 2021)

Areas	Code	Actions
1. Carbon Border Adjustment	CBA.1	Analyzing the impacts on energy and material intensive sectors
	CBA.2	Identifying the sectoral decarbonization road maps
	CBA.3	Instituting a carbon-pricing mechanism
	CBA.4	Analyzing sectoral carbon costs at the EU Border and developing a support mechanism to Turkish exporters
	CBA.5	Designing an appropriate system to monitor GHG emissions of the manufacturing industry
	CBA.6	Giving technical assistance on reporting aligned with the methodology and standards determined by the EU

Source: (Atil Aşıci and Acar, Towards a Green Deal in Turkey: Potentials of EU-Turkey cooperation on the green transition 2021)

EU – Turkey Climate Cooperation

Climate cooperation between EU and Turkey is relevant and took different shapes throughout time. It exists both at bilateral and multilateral level, covering many domains. Although accession negotiations are currently on hold, the screening process for the Chapter on Environment was completed in 2006 and the Chapter was opened to accession negotiations at the Intergovernmental Conference held in Brussels in December 2009.

For instance, the Turkey-EU High Level Dialogue on Climate could be an effective strategic platform, if followed up by serious implementation.

The first meeting of the Turkey-EU High Level Dialogue on Climate was held in Brussels in September 2021. “Both parties, represented by EU Commissioner Frans Timmermans and Turkey’s Minister of Environment and Urbanization Murat Kurum, agreed on the fact that climate issue is a supra-political issue and that steps to combat climate change should be taken decisively. They promised to create subject-based delegations to discuss in detail all the issues related to climate change, emissions trading at the border and future steps” (Republic of Turkey 2021).

The second meeting was held in Istanbul in January 2022, Timmermans commented: “Being close partners for the green transformation of our economies matters now more than ever,” following a meeting with Turkish Trade Minister Mehmet Mus. (Anadolu Agency 2022)

“Since 2003 Turkey has been at the centre of the most ambitious external-energy policy initiative ever established by the EU, the realization of the Southern Gas Corridor. In parallel with this initiative, the authorities in Ankara have placed ‘contribution to Europe energy security’ among the four key priorities of their own national energy strategy.” (Sartori, Colantoni, et al. 2017)

In fact, Turkey aimed at becoming a corridor for energy sources in the Middle East and the Caspian basin towards European consumer markets. The gas pipelines running through Turkey were the basis of this strategic relationship.

“In any case, one should not forget that EU-Turkey energy cooperation, both at the bilateral and at the multilateral level, covers a wide range of increasingly complex issues that go beyond security concerns in the gas sector” (Sartori, EU-Turkey Relations: Theories, Institutions and Policies 2021).

“In fact, in the long term, the diversification of supply routes with pipelines is no longer on the agenda for the EU” (Tastan 2022).

For instance, compared to gas, a higher level of electricity trade between Turkey and its EU neighbours is facilitated and stimulated by Turkey’s membership in the European Network of Transmission System Operators (ENTSO-E), resulting in technical compatibility of the respective distribution grids.

Implications of CBAM for Turkey

In this chapter we will explore the implications of CBAM on the Turkish economy, both on aggregate level and sector-specific level. The main sources used in the redaction of this chapter are two dedicated studies: one carried out by the Economic Research Forum “Potential Effects of the EU’s Carbon Border Adjustment Mechanism on the Turkish Economy” (Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU’s Carbon Border Adjustment Mechanism on the Turkish Economy 2021) and the other one carried out by the European Roundtable on Climate Change and Sustainable Transition (ERCST) “EU Carbon Border Adjustment Mechanism and implications for Turkey” (Maratou 2021)

In addition, at the margin of the 12th Conference on Green Economy held in Istanbul on 10 June 2022 (organized by the German Heinrich Böll Foundation), Dr. Ahmet Atil Aşıci kindly agreed to release his expert opinion regarding some of the points and open questions raised in this research. His contribution clearly represent an added value for this research work and reflect the latest state of play in the discussion around CBAM in Turkey.

Aggregate Implications

Let us recall that 41.3% of the country's exports were destined for the EU in 2020. Now, let us continue with an overview of the carbon content of Turkish exports to the EU. According to 2018 data, "Turkish exports to the EU contained 36.2 Mt of CO2 equivalent emissions (considering scopes 1, 2 and 3), being mostly concentrated in sectors such as cement, machinery, automotive, iron & steel and textiles" (Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy 2021).

Already here we can observe at least two product categories falling under the scope of CBAM - cement and iron & steel - although with sensible differences between the two sectors (for instance the distribution between different emissions' scopes), with the latter having a larger margin to negotiate an exemption or at least a milder treatment, as we will see in the next chapter.

Figure 6 in the Annexes An overview of CBAM products (excluding fertilizers) exports from Turkey to the EU, in terms of economic value and GHG emissions.

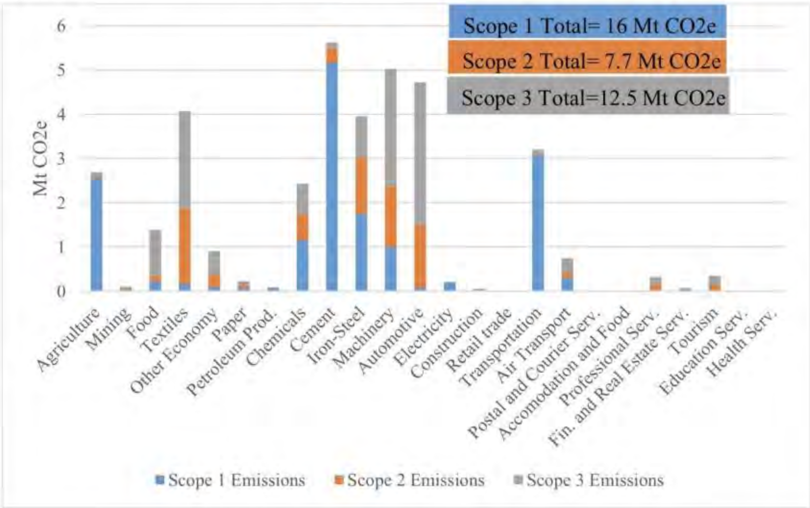
As already mentioned, Turkey suffers from high carbon-intensity of the electricity production, making Turkish exports more vulnerable to carbon pricing measures such as CBAM. The figure below describes the GHG emissions embodied in Turkish exports to the EU in 2018. We can observe that "scope 2 emissions embedded in Turkish exports to the EU holds a share of 21.3% of the total (36.2 Mt CO2 equivalent)"[3] (Atil

[3] "The emissions of the plants are grouped under 3 sections. Scope 1 is direct emissions generated by owned or controlled sources; Scope 2 emissions are indirect emissions from the generation of purchased energy; and Scope 3 emissions are indirect emissions

Aşıci, Sevil and Yeldan, Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy 2021).

The textiles, chemicals, iron & steel, machinery and automotive sectors are particularly exposed to the effects of CBAM because of their high level of indirect emissions (scope 2 and scope 3 emissions), such as consumption of electricity.

Figure 1. GHGs emissions embodied in Turkish exports to EU28 (2018, Mt CO2e)



Source: (Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy 2021)

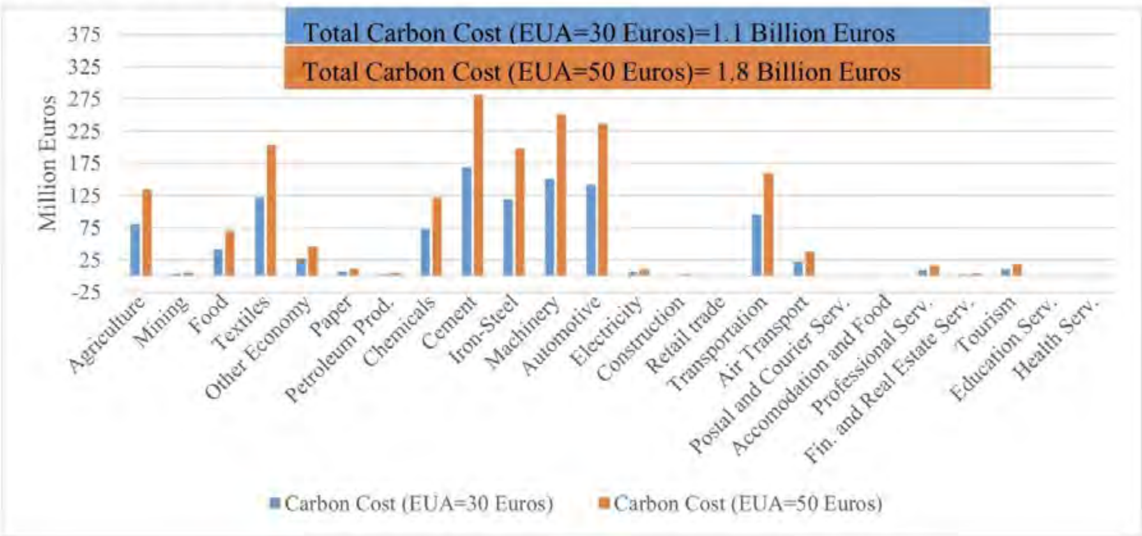
The results of the study carried out by the Economic Research Forum suggest that CBAM would cost some 1.1 to 1.8 billion euros every year to the Turkish economy, and a potential loss between 2.7% and 3.6% of the GDP by 2030 compared to pre-2019 BAU conditions, depending on projections based on a 30 or 50 euros/GHGt scenarios. The figure below gives an overview of the carbon bill for each sector under the two scenarios. According to other studies, such as the report by Turkish Industry and Business Association (TÜSİAD), the introduction of CBAM could bring an additional cost of 1.08 billion euros to Turkey's manufacturing sector.

---

from the production of other purchased inputs (WRI and WBCSD, 2004)". Source: (Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy 2021)

For instance, considering the worst case scenario, where scope 1, 2 and 3 emissions are priced, as proposed by the EP, the cement and the electricity sectors are expected to be the worst affected. This set up would entail that for a given value of export revenues, “the cement and electricity sectors should pay back 13-22% and 11-18% respectively, depending on either the 30 or 50 euros/GHGt scenario” (Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU’s Carbon Border Adjustment Mechanism on the Turkish Economy 2021).

Figure 2. Carbon Costs (Million Euros)



Source: (Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU’s Carbon Border Adjustment Mechanism on the Turkish Economy 2021)

Beside quantitative assessment, this research also relies on qualitative evaluation. In this regard, when asked about the amendments to CBAM proposed by the European Parliament, Dr. Ahmet Atil Aşıci brought to the table his perspective: “I found them coherent in fact. The main aim of CBAM is to force trading partners to decarbonize. It is a huge task and will take time. So it is understandable that it will start in a limited version to understand which is working which is not. The decision that CBAM revenues will be transferred to the EU budget is not favorable for Turkey of course but again regarding the internal consistency of CBAM it is understandable.” (Atil Aşıci, 12th Conference on Green Economy 2022)

On a more general note, Turkish industry representatives also commented on the CBAM proposal. For instance, in June 2021, Simone Kaslowski, President of the Turkish Industry and Business Association (TÜSİAD) declared "The European Green Deal, which outlines the growth strategy for the EU, our biggest trading partner, will have consequences for our industry as well as our service sector. We think that it is essential to update the Customs Union with the EU to take into account green as well as digital transformation". (Kaslowski 2021)

Beside industry representatives, the EGD also attracted wide attention from civil society. In particular three think tanks called for urgent action towards a green transformation in Turkey in March 2021 (Istanbul Policy Center, The Economic Policy Research Foundation of Turkey and Economic Development Foundation). (Atil Aşıci and Acar, Towards a Green Deal in Turkey: Potentials of EU-Turkey cooperation on the green transition 2021)

In addition, Dr. Ahmet Atil Aşıci declared that "Turkey can enhance relations with the EU over Green Deal through cooperation with the EU decentralized agencies (European Environmental Agency and European Institute of Innovation and Technology) and participating in industrial alliances (Clean Hydrogen Alliance, Battery Alliance)." (Atil Aşıci, 12th Conference on Green Economy 2022)

In conclusion, let us briefly turn to how Turkey might bring forward its interest at the negotiations table with the EU. Although the country's exports to the EU will be affected by CBAM, Turkey is rich in raw materials that are attractive to Europe's ambitions to decarbonise its economy and rapidly implement electrification in many sectors. For instance, Turkey is the major supplier of a critical mineral such as borate, which is used in the production of batteries. In this perspective, the Turkish government might threaten the EU to further limit export on some minerals, as an act of retaliation.

Sectoral Implications: Cement, Steel and Electricity

Calculation Method

Before deep diving into any sectoral analysis of the effects of CBAM on the Turkish economy, a crucial methodological disclaimer must be done. As we mentioned in the first section, it is still unclear how the EU will calculate the actual carbon intensity of a specific product category and subsequantly put a price on it.

On the one hand the study by the Economic Research Forum is based on original data on GHG source (when available) or, alternatively, on "data derived by using the share of sectoral intermediate input demand to the aggregate volume of sectoral output" (Atil Aşıci, Sevil and Yeldan, Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy 2021). In addition, it is based on the assumption that CBAM will cover scopes 1, 2 and 3 emissions and will not credit policies in exporting countries entailing a carbon price, meaning that the full EU carbon price will apply to exports.

On the other hand, the study by the European Roundtable on Climate Change and Sustainable Transition (ERCST) presents six different scenarios corresponding to six potential calculation methods based on a combination of two variables:

"1. CO2 intensity (CO2t /ton of product)

- Exporting country-specific average (nonEU CO2 intensity)
- EU average (EU CO2 intensity)
- Differential between average intensity in the exporting country and the EU (ΔCO2intensity)

2. Crediting of foreign climate policy:

- Yes: CBAM will credit policies in exporting countries entailing a carbon price (ΔCO2 price)
- No - the full EU carbon price will apply to exports (EUACO2price)

For each of the six scenarios, results are presented according to different emissions scope, for a total of twelve scenarios (expect for electricity):

- CBAM will account for direct emissions only (Scope 1)

- CBAM will account for direct emissions (Scope 1) & indirect emissions (Scope 2)" (Maratou 2021)

Figure 7 in the Annexes provides a useful summary of these scenarios. An important point to be kept in mind is that the sectoral analysis presented below reflects ERCST elaborations based on the six (x 2) scenarios and of a price of 70 euros/ tCO_2.

Cement

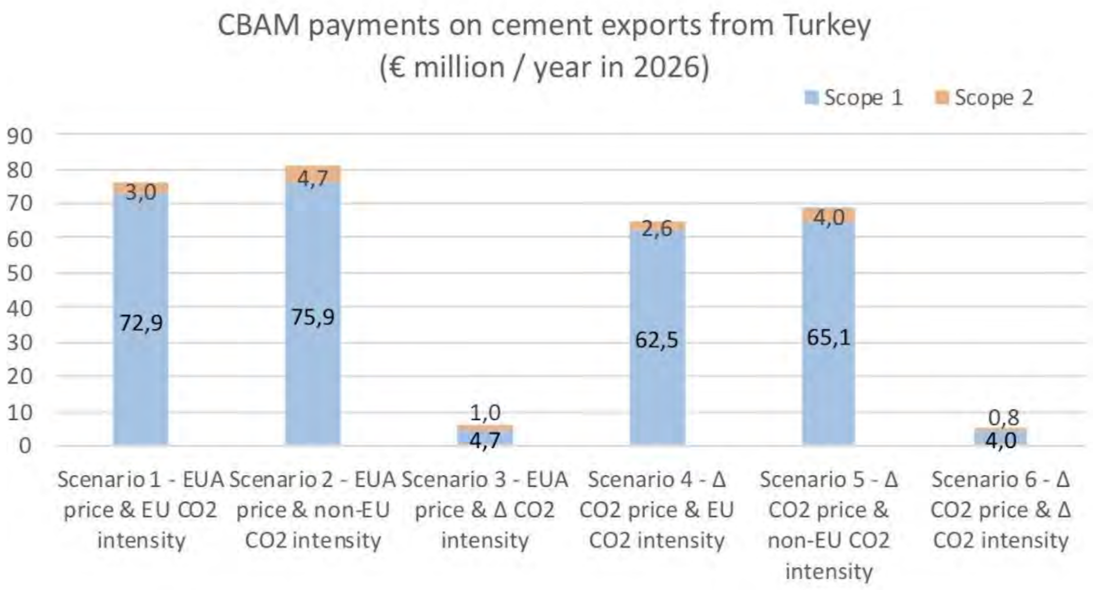
As explained in the previous paragraph, the Turkish cement industry will be the most impacted by CBAM, as a consequence of considerable direct emissions (scope 1) and substantial market shares in the EU: 13% of Turkish total cement exports, for a value of 108 million euros. (Erixon 2021)

In addition, "a study recently commissioned by Chatham House reveals that 30% of the EU cement imports covered by CBAM come from Turkey. However, we should not forget that, even though the Turkish cement exports to the EU have grown over the last years, the increase in exports towards East Asia and Latin America have also grown at a much faster pace than those of the EU" (Erixon 2021).

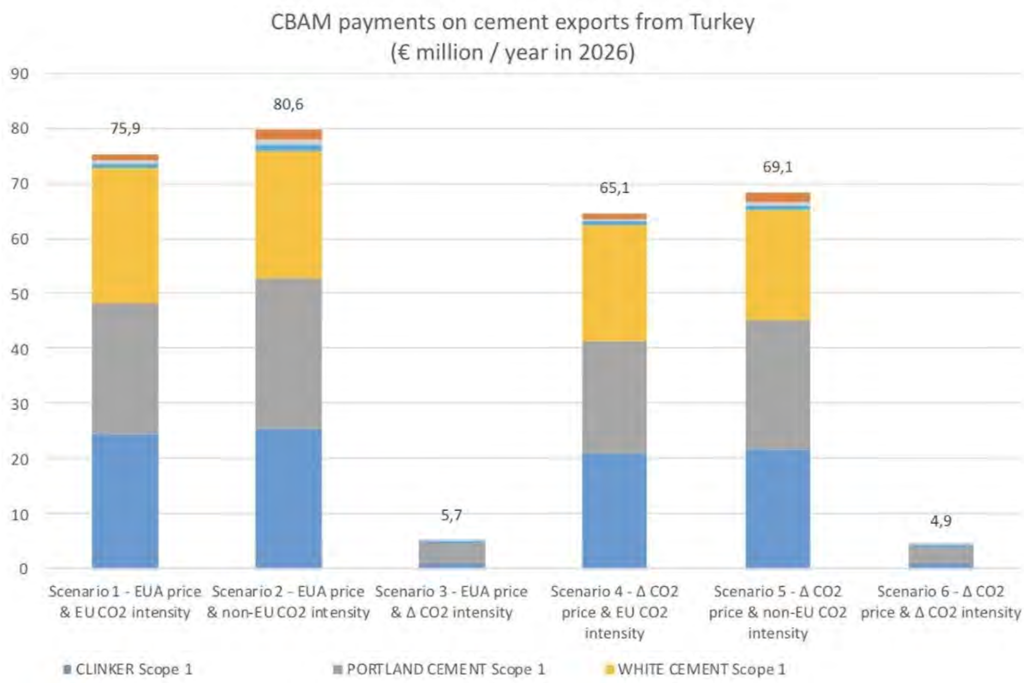
This trend might divert Turkey's attention from a declining West to rising East, thus diluting the impact of CBAM-like measures.

In the first figure below we can observe that Scenario 3 and Scenario 6 (where exporters pay for the part of average CO_2 intensity in exporting countries in excess to the average EU CO_2 intensity) are the most favorable for the cement sector, regardless of the fact that CBAM will credit policies in exporting countries entailing a carbon price or not, and irrespective of the fact that indirect emissions are included or not.

In the second figure below, we can observe a more detailed elaboration partitioned according to the specific kind of cements: Clinker, Portland and White. The takeout is that, for the two most favorable scenarios described above (3 and 6), the CBAM price would be close to zero by excluding Portland cement.



Source: (Maratou 2021)



Source: (Maratou 2021)

Steel

In terms of trade volumes, a share of 44% of Turkish steel exports is devoted to the EU market (2018) for a value of €2.6 billion (2020). (Erixon 2021)

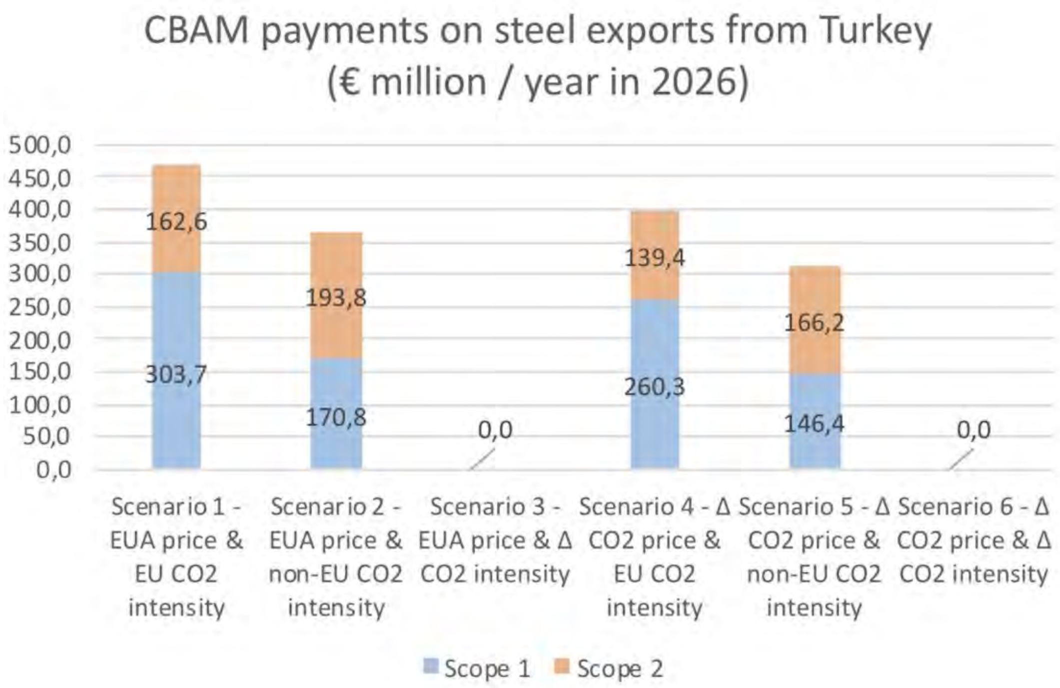
According to the EC proposal, Turkish steel exports to the EU will not be shielded against CBAM by the Customs Union nor by the ECSC FTA. However, the Turkish steel industry is best placed to claim for exemption, in virtue of these bilateral agreements.

In this regard, "Ugur Dalbeler, vice president of the Turkish Exporters' Association (CIB) and CEO of major Turkish steel producer Colakoglu, declared: "As the EU's share in overall Turkish steel exports is around at 35-40%, this kind of an additional [trade] measure will have another negative effect on export volumes", adding that due to the Customs Union and European Coal and Steel Community Free Trade Agreement (ECSC FTA) between EU and Turkey, Turkey should be exempted" (Can 2020).

Another industry representative, "Veysel Yayan, General Secretary of the Turkish Steel Producers' Association (TCUD), declared: "As Turkish mills are already investing in green steel, don't think that a carbon border adjustment will have a significant effect on our exports to the EU", adding that the renewable energy support mechanism in Turkey is already notably increasing Turkish mills' energy costs and that all carbon pricing measures should be in compliance with WTO rules" (Can 2020).

As shown in the first figure below, similarly to cement, the best case scenarios for steel producers are the ones where exporters pay for the part of average CO2 intensity in exporting countries in excess to the average EU CO2 intensity. According to these scenarios the carbon bill would be equal to zero due to the fact that Turkish and European carbon-intensity of steel production is comparable.
On the contrary, the worst case scenarios are those where exporters pay for the part of average CO2 intensity in exporting countries in excess to the average EU CO2 intensity, with a carbon bill estimated between 260 and 465 millions € / year.

According to other studies, such as the already mentioned report by TÜSİAD, "the introduction of CBAM could bring an additional cost of 110 million euros for the Turkish steel sector" (Can 2020).



Source: (Maratou 2021)

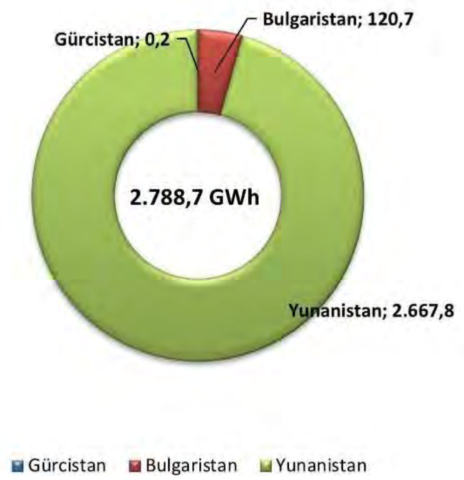
Electricity

When it comes to electricity, there are no indirect emissions to be considered, as these (scope 2) originate from the consumption of electricity itself. In fact, electricity is not a primary energy source as it is not available in nature and has to be produced from other sources (fossil or renewables).

Electricity consumption does generate emissions, but electricity generation from fossil primary sources creates (a lot of) emissions. In the case of electricity from renewable primary sources its production does not create emissions (or at least very little).
In other words, electricity generation creates emissions only when it comes from the combustion of fossil fuels.

Because electricity is not a physical commodity, it can only be transported via cables. The only existing infrastructures connecting Turkey and the EU are the grids linking the country with Bulgaria and Greece. In 2019 Turkey exported 1,2 TWh to Bulgaria and 26,7 TWh to Greece, for a total of about 27,9 TWh electricity exports to the EU.

GRAFİK V.II- 2019 YILI İHRAÇ EDİLEN ELEKTRİK ENERJİSİNİN ÜLKELERE DAĞILIMI (GWh)

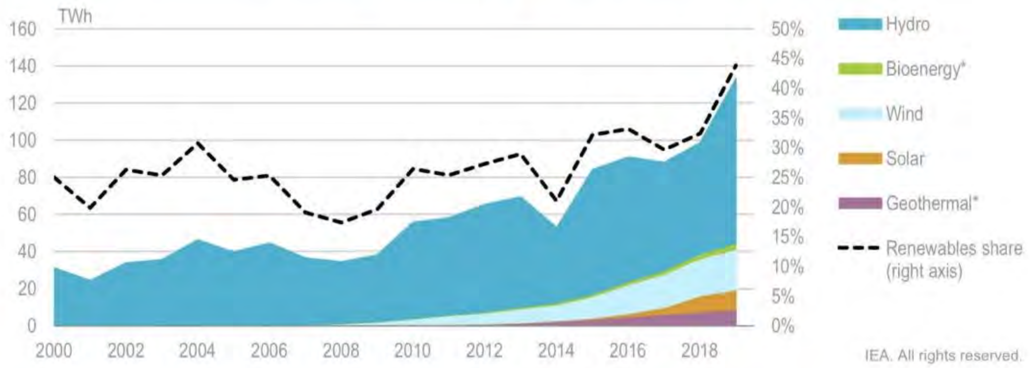


Translation: Distribution of electric energy exported by countries (GWh) Bulgaristan: Bulgaria / Yunanistan: Greece

Source: (Teias 2019)

“In 2019, hydropower accounted for around 29% of total electricity generation, while wind came in at 7%, solar at 3%, geothermal at 3% and bioenergy at 1%, altogether accounting for 43% of total electricity generation” (International Energy Agency 2021).

Figure 5.5 Renewable energy in electricity generation, Turkey, 2000-19



Hydropower dominates renewable electricity generation in Turkey, but other sources have increased rapidly in the last decade.

* *Bioenergy* includes solid primary biofuels, liquid biofuels and biogases.

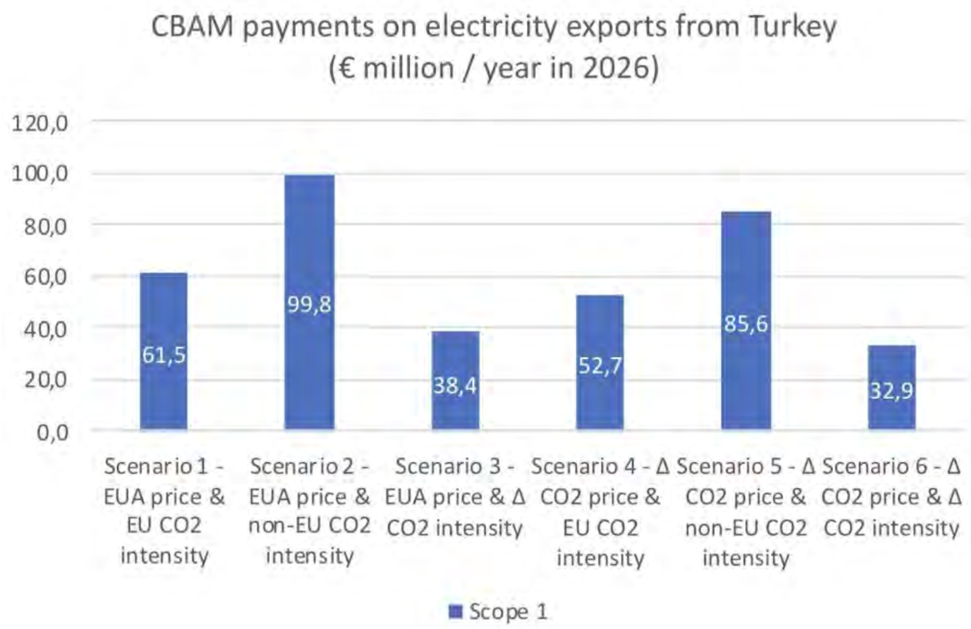
Note: TWh = terawatt hour.

Source: IEA (2020), *IEA World Energy Statistics and Balances* (database), www.iea.org/statistics.

Source: (International Energy Agency 2021)

As there are no exact data available about the primary source of the electricity exported to the EU, hereby we make the assumption that it contains the same share of electricity generated from renewable primary sources as the total electricity generated in Turkey. Following this reasoning, we can infer that 12 TWh (43% of 27,9 TWh) of electricity exported by Turkey in the EU comes from renewable primary sources, in 2019. Thus, these 12 TWh can be considered as clean and not falling under the scope of CBAM and the other 15,9 as potentially subject to CBAM.

In the figure below we observe that unsurprisingly, as for cement and steel, the two most favorable scenarios are those where exporters pay for the part of average CO2 intensity in exporting countries in excess to the average EU CO2 intensity (scenarios 3 & 6). Similarly to cement, but unlike steel, the least favorable scenarios are those where exporters' emissions are determined based on average CO2 intensity in exporting countries (scenarios 2 & 5). However, the difference in CBAM payments for scenarios 2 & 5 compared to scenarios 1 & 4 is much greater for electricity (30 / 40 million euros difference) than for cement (4 / 5 million euros difference), where the two sets of scenarios are almost equal.



Source: (Maratou 2021)

Takeouts

Hereby, before coming to the conclusions, we will try to answer all the questions we have raised in the introduction, both considering the information presented in the chapters and including some perspectives gained during the redaction of this work.

Let us start with a summary of the implications of CBAM on Turkey (sub-question1). As already mentioned, the mere economic impact of CBAM on the Turkish economy is expected to amount between 1.1 and 1.8 billions euros yearly, corresponding to a potential loss between 2.7% and 3.6% of the GDP by 2030 compared to pre-2019 BAU conditions. Among the others, the cement steel and electricity sectors would be the most affected ones because of their high level of direct or indirect emissions.[4] Overall, Turkish manufacturers will lose competitiveness vis-a-vis European producers, because of the increased costs.

A potential implication in this direction could be the trade diversion of CBAM-covered products from the EU market to other regions of the world which have less demanding standards, and thus make trade more profitable. In fact, the demand from Asian markets is growing in every sector and African markets will soon enter the game.[5]

However, Turkey is receptive toward EU policies and the inclusion of Scope 2 emissions is likely to push the country toward a market transformation in its electricity generation, through further development of the installed capacity of renewable energies.[6] Although it might be too early to explore alternative ways such as extensive implementation of CCUS technologies[7], it is very likely that the country will establish a carbon pricing system to shield its economy against CBAM.[8]

The question whether Turkey is likely to adopt a carbon pricing is a crucial point in this research (sub-question 2). Turkey does not have a carbon pricing mechanism in place yet, although it could support the country reach its climate goals in a cost-effective

---

[4] See: Section 3 – Aggregate implications
[5] See: Section 3 - Cement
[6] See: Section 3 - Renewable Energy
[7] See: Section 3 - Complementary Decarbonisation Strategies
[8] See: Section 3 - Carbon Pricing

way. As mentioned above, Turkey is expected to announce its own emission trading scheme in 2023, to be based on the already implemented MRV system. However, it is still unclear whether it will be linked to the EU ETS, creating a *de facto* interoperability between the two systems, as wished by the Ministry of Environment and Urbanization. Turkey is the fifth most exposed country to CBAM and a carbon pricing measure would be the most direct way to protect the economy from the border adjustment tariff.
A further reason to implement an own national emissions trading system is the fact that revenues would flow into the national budget (hopefully financing green transition projects) instead of contributing to the EU budget. [9]

In Brussels negotiations over CBAM are still open and timely advocacy action could still influence the debate in the Parliament and in the EU Council.[10] Let us look at the priorities that Turkish representatives to the EU should focus on to promote the interest of their country (sub-question 3).

From a Turkish perspective the best option of course would be a change in the geographical scope of CBAM, completely excluding Turkey in virtue of the Customs Union, as for non-EU countries participating in the ETS. However, this option seems to be very unlikely to be realized. A milder version of this option could be the exemption of steel in virtue of the overlap between the Customs Union and the European Carbon and Steel Community Free Trade Agreement (ECSC FTA), as advocated by the Turkish Exporters' Association.[11]

If total or partial exemption of the Turkish economy is not possible, then Turkish representatives in Brussels can still insist on a series of other points to smooth the effects of the CBAM on Turkey. For instance, they can try to influence the discussion on the calculation method of the carbon intensity of a product.
In this case the best scenario for their industries would be a calculation based on the

[9] See: Section 3 - Carbon Pricing
[10] See: Section 1 - Legislative Iter: The Council and the Parliament
[11] See: Section 3 - Steel / Customs Union

average difference between European and Turkish carbon intensity in a given sector, instead of a calculation based on the total carbon intensity of a product.[12]

Another crucial priority would be inclusion of only Scope 1 emissions.[13] If achieved, although unlikely, this eventuality would considerably reduce the burden for the steel industry. However, the situation for electricity would not change at all and only very slightly for cement.[14]

In addition, advocacy activities could focus on having the EU to credit alternative climate policies and potentially deduct them from the CBAM bill.
This option would allow more flexibility for energy intensive economies to shift the decarbonisation efforts from industry to other sectors where decarbonisation is easier.[15]

Finally, a last, though still crucial, point would be the extension of the transition period beyond 2026.[16] In this view, every additional year for the transition would allow the country to better prepare its industry to comply with CBAM requirements. However, this option must be coupled with a mindful reflection on how not to lose the competitive advantage vis-a-vis other suppliers and how not to let other suppliers gain competitiveness against Turkey.

Which arguments can Turkey bring to the negotiations table to convince the EU to take its concern seriously? As already happened in the past, Turkey can use its special geographical and geopolitical position as a tool of retaliation. For instance, beside the usual card of the refugee crisis, the country has two additional powerful instruments at disposal, as already mentioned in Section 2.
The first one is the control over the Southern Gas Corridor, an infrastructure that allows Turkey to manipulate gas supplies to South European countries.[17] Russia

[12] See: Section 3 - Calculation Method
[13] See: Section 1 - Direct vs Indirect Emissions
[14] See: Section 3 - Sectoral Implications: Cement, Steel and Electricity
[15] See: Section 3 - Calculation Method
[16] See: Section 3 - Carbon Pricing
[17] See: Section 2 - Gas

recently provided an excellent example of how powerful this kind of move could be. However, this option seems to be disproportionate if compared to the entity of the potential impact of CBAM.

The second one, much more coherent with the scope of CBAM, is the control over mineral resources necessary to the decarbonisation and the electrification of the European economy. Turkey might decide to impose trade barriers and tariffs over this category of raw materials and there is very little the EU could do to prevent it.[18]

On a more general note, we can now try to assess the impact of CBAM - and EU climate policy at large - on Euro-Turkish relations (sub-question 4).

To be fair, the answer to this question mostly depends on the political will of Turkish leadership to stay anchored to the European train and appropriately fund the green transition, and the economic and technical capacity of Turkish industries to evolve rapidly and adapt to the new productive paradigm.

In this historical moment Turkey is basically facing the political choice between pursuing the prospects of EU membership or embarking in a neo-ottoman foreign policy. These two options seem to be incompatible and bring different implications: being a poor European country or a rich Middle-Eastern country? Implementing ambitious and rigorous climate policies or joining the climate justice chorus of developing countries? The answers to these and other questions will design the pattern of EU - Turkey relations in the coming decades. On the very short-term, the Ukrainian crisis apparently produced the effect of compacting the members of NATO against Russia, but for how long will it last and how will Turkey decide to behave after?

At least on a nominal level, Turkey seems willing to follow the EU in its decarbonisation journey, but concrete steps are still to be taken. [19] As observed by Dr. Ahmet Atil Aşıci, in july 2021 the Trade Ministry of Turkey announced the European Green Deal Action Plan in response to EGD with 81 actions. However, most of them are vague and reflect intentions rather than concrete actions.[20] In addition, there is no date for the phase

[18] See: Section 3 - Aggregate Implications
[19] See: Section 3 – Climate Policy
[20] See: Section 3 - Green Deal Action Plan

out of fossil and no measures regarding just transition.
It is really a matter of priorities: the country has to make a choice between short-term growth or long-term and sustainable development. In this view, a preference for long-term and sustainable development will bring Turkey closer to the European Union and attain the goal of extending its leadership in the whole region. In conclusion, if businesses and civil society will manage to cooperate and formulate clear objectives for the future of the country, then politics will follow accordingly.[21]
The result of this synthesis will also determine the future of EU - Turkey relations.

After having completed the picture of the case study on Turkey, we can finally approach the general research question whether the EU Climate Policy will be a dirver for decarbonisation in the Mediterranean. Considered the EU climate policy, the general energy and emissions profile of the Mediterranean region and the case study on Turkey, we can identify a few elements that will help us answer the question.

We can assert that climate action can be a vector for renewed cooperation in the region, if a number of conditions are met. We have observed that most of the emissions both globally and in the region, come from energy (production and consumption), accordingly this should be the preeminent topic to be addressed.[22] However, as discussed in the second section, at least one among Algeria, Egypt, Morocco and Turkey appears in the list of the Top 5 suppliers of the EU for each CBAM-covered product, except for electricity.[23] Thus, electricity generation (preferably from renewable sources) is the field where most of the efforts should be concentrated to bring about a real change on a regional-scale level.

As someone notably pointed out in 2008 at the inaugural Union for the Mediterranean summit in Paris "Europe had built around coal and steel, and now both shores of the Mediterranean had to do so around water and sun".[24] Such an inspiring quote is a suggestion to euro-mediterranean countries to develop joint programs (both bilateral

[21] See: Section 3 - Green Deal Action Plan
[22] See: Section 2 - Emissions Profile
[23] See: Section 2 - CBAM in Practice
[24] See: Section 2 - Renewables

and multilateral) aimed at building the necessary knowledge factbase and crucial infrastructures for the extensive deployment of photovoltaic, concentrated solar power and hydroelectric plants to supply the region with clean electricity.[25]

Considering the extreme diversity of the region, every country should contribute according to its natural, financial and human capital in order to reach the common goal.[26] In this perspective, a successful outcome in this field might trigger a chain reaction in many other domains, transforming the challenge of decarbonisation into a vector for further integration of the euro-mediterranean region.

However, the development of electricity generation and distribution infrastructures needs adequate funding. The EU will manage to spill-over the effects of its decarbonisation agenda in the region if it will be able to offer financial support to SEM countries in pursuing this effort. Accordingly, the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) should finance, in partnership with other private actors, the development of such strategic assets, as happened for the Noor solar park in Morocco.[27]

In this view, increasing demand for (clean) electricity by the EU might foster domestic production (and consumption) in SEM countries. This is a simple but crucial point.[28]

In addition, the climate policy of the EU could lead to progressive decarbonisation in the region by giving active technical support in the establishment of carbon pricing measures, complemented by financial support from the World Bank, as for the case of Turkey.[29]

A pragmatic approach based on past experiences would suggest that energy cooperation in the region should be developed at bilateral level, instead of over ambitious and not always efficient multilateral efforts. [30]

---

[25] See: Section 2 - Cooperation Projects
[26] See: Section 2 - Energy Profile
[27] See: Section 2 - Renewables
[28] See: Section 2 - Cooperation Projects
[29] See: Section 3 - Carbon Pricing
[30] See: Section 2 - Cooperation Projects

By means of European Neighborhood Policy (ENP), the EU can develop effective bilateral channels to support the energy transition in SEM countries and can finance efforts in line with the EGD vision through the European Neighborhood Policy Instruments (ENPI), among the others.
In addition, a powerful instrument in the hands of Europeans is the possibility to offer these countries to establish, update or factually implement bilateral free trade agreements. Importantly, in order for these bilateral FTAs to be effective drivers for a decarbonisation process, they must contain some serious climate action clauses.[31]

However, bilateral cooperation on one side does not exclude multilateral collaboration on the other, especially when it comes to awareness building, information spreading and technology and knowledge transfer. In particular, these activities can be carried out within the already existing regional fora such as the many platforms sponsored by the Union for the Mediterranean.[32]

In conclusion, if the EU decides to follow a go-it-alone approach, it might just fail or result way less effective than expected. On the contrary, if the EU manages to link its climate efforts to all the other chapters of its external action, through a pervasive (and persuasive) distribution of climate clauses within its international agreements, then it will be able to drive decarbonisation not only in the region but also globally.[33]

Suggestions for Further Research

This work aspires to be the basis for further research in the field. Here are a few ideas on how to integrate and develop the current text and provide more precise answers the research questions.
A first recommendation is to investigate CBAM-covered trade in the Mediterranean, to spot sensitivities in the regional commercial pattern. Secondly, aggregate data about emissions and energy in the Mediterranean are available but outdated, especially in the light of recent events (Covid, Paris Agreement, Ukraine). Thirdly, it would be

[31] See: Section 3 - Prospects for Modernisation
[32] See: Section 2 - Cooperation Projects
[33] See: Section 1 - Europe as a Climate Leader

interesting to expand the research to the impact of the Circular Economy Action Plan both in Turkey and in the Mediterranean. Finally, one could harmonise the calculation method between the ERF and the ERCST studies, to get a better picture of the expected impact of CBAM on Turkey.

Conclusions

Europe strives to be the global leader in climate action due to economic and political reasons and the target of becoming carbon neutral by 2050 is a clear indication of such ambition. The European Green Deal designs the roadmap to reach this goal.

The Fit-for-55 package lays down the intermediary targets to reduce emissions by 55% by 2030, compared to 1990 levels and one of the most discussed policy files under this package is the Carbon Border Adjustment Mechanism, aimed at preventing carbon leakage. This measure is still under negotiation and will have an impact on third countries, including in the Mediterranean neighbours.

The second section explored the energy and emission profile of the Mediterranean region, revealing an uneven distribution of energy resources and an overall high dependency of fossil fuels. However the region has a great potential for renewables (especially solar and hydro) but the lack of infrastructures, both for generation and distribution, hampers further developments in this direction. Energy cooperation in this region proved to be more efficient at a bilateral level, although many multilateral fora exists and play a role.

The third section is a case study about the effects of CBAM on Turkey, a sort of 'special guest' among other Mediterranean countries due to the high integration with the European economy. The country's developed industrial sector produces a lot of emissions and the energy mix is still very carbon intensive. However, the production of electricity is covered by a fair share of renewables, mostly from hydro. Although the country recently raised its climate ambitions, many consider the policies not to be in line with the targets of the Paris Agreement. CBAM is expected to have an impact on the Turkish economy between 1.1 and 1.8 billion euros every year and the most exposed sectors will be cement, steel and electricity.

We came to the conclusion that the EU should not try the go-it-alone approach in pursuing its climate policy, but rather make it an inclusive process (supporting other countries in the development of decarbonisation strategies) and at the same time include effective climate clauses and conditionalities in diplomatic and economic relations with other countries, as it does with democracy and human rights.

Bibliography

Anadolu Agency. 2022. *Energy cooperation needed in E. Med. to ease dependence on Russian supplies.* https://www.aa.com.tr/en/economy/energy-cooperation-needed-in-e-med-to-ease-dependence-on-russian-supplies/2544515.

Anadolu Agency. 2022. "EU: Cooperation with Turkiye for 'green transformation' more important than ever."

Atil Aşıci, Ahmet , Acar Sevil , and Erinç Yeldan. 2021. *Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy.* Istanbul: Economic Research Forum.

Atil Aşıci, Ahmet, interview by Michele Rattotti. 2022. *12th Conference on Green Economy* (10 June).

Atil Aşıci, Ahmet, and Sevil Acar. 2021. *Towards a Green Deal in Turkey: Potentials of EU-Turkey cooperation on the green transition.* Istanbul / Brussels: Dr. Sergey Lagodinsky, MEP.

Bioenergy International. 2022. *ENVI calls for higher ambition in CBAM.* https://bioenergyinternational.com/.

Can, Cenk. 2020. "A carbon border tax could be against the WTO rules: Dalbeler."

Canfin, Pascal. 2022. *Twitter.* https://twitter.com/pcanfin/status/1534584653826478081.

Carbon Trust. 2022. *Briefing: What are Scope 3 emissions?* https://www.carbontrust.com/resources/briefing-what-are-scope-3-emissions.

Clémençon, Raymond. 2016. "Sustainable Development, Climate Politics and EU-Leadership: A Historical Comparative Analysis." *European Journal of Sustainable Development.*

Climate Action Tracker. 2021. *Turkey.* https://climateactiontracker.org/countries/turkey/.

Climate Focus. 2021. *Turkish Carbon Market.* http://turkishcarbonmarket.com/background/carbon-markets-in-turkey.

2009. *Consolidated version of the Treaty on the European Union (TEU).*

2009. *Consolidated version of the Treaty on the Functioning of the European Union (TFEU).*

Council of the European Union. 2022. *Council agrees on the Carbon Border Adjustment Mechanism (CBAM).* https://www.consilium.europa.eu/en/press/press-releases/2022/03/15/carbon-border-adjustment-mechanism-cbam-council-agrees-its-negotiating-mandate/.

Daily Sabah. 2022. *Climate action can save Turkey nearly $150B by 2040: World Bank report.* https://www.dailysabah.com/business/economy/climate-action-can-save-turkey-nearly-150b-by-2040-world-bank-report.

Delegation of the European Union to Turkey. n.d. *Customs Union, Supporting the Growth of EU - Turkey Trade.* https://www.avrupa.info.tr/en/customs-union-supporting-growth-eu-turkey-trade-52.

Deloitte. 2021. *„Fit for 55” package.* https://www2.deloitte.com/lt/en/pages/consulting/topics/Fit-for-55-package.html.

Desertec Foundation. n.d. https://www.desertec.org/.

EPRS - European Parliamentary Research Service. 2021. *EU climate action policy: Responding to the global emergency.* European Parliament.

ERCST. 2021. https://ercst.org/.

Erixon, Fredrik. 2021. *Europe's Carbon Border Adjustment Mechanism: Time to Go Back to the Drawing Board.* ECIPE.

European Commission. 2020. *2050 long-term strategy.* https://ec.europa.eu/clima/eu-action/climate-strategies-targets/2050-long-term-strategy_en.

—. 2019. *A European Green Deal.* https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en.

—. 2021. *Carbon Border Adjustment Mechanism: Questions and Answers.* https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3661.

—. 2005. *EU Emissions Trading System (EU ETS).* https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets_en.

—. 2021. *European Climate Law.* https://ec.europa.eu/clima/eu-action/european-green-deal/european-climate-law_en.

—. 2021. *Proposal for a Regulation of the European Parliament and of the Council establishing a carbon border adjustment mechanism - COM(2021) 564 final.* Brussels.

—. 2008. *Second Strategic Energy Review - AN EU ENERGY SECURITY AND SOLIDARITY ACTION PLAN, COM(2008) 781 final .* Brussels.

—. 2019. *The European Green Deal COM(2019) 640 final.* Brussels.

—. 2020. *Turkey: EU trade relations with Turkey. Facts, figures and latest developments.* https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/turkey_en.

European Council. 2021. *Fit-for-55.* https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/.

European Environmental Agency. 2019. *Energy Intensity in Europe.* https://www.eea.europa.eu/data-and-maps/indicators/total-primary-energy-intensity-3.

European Parliament. 2021. https://www.europarl.europa.eu/portal/en.

Eurostat. 2015. *Euro-Mediterranean statistics.* Luxembourg: Publications Office of the European Union.

—. 2017. *Glossary: carbon dioxide equivalent.* https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Carbon_dioxide_equivalent .

FEMIP. 2008. *Study on Climate Change and Energy in the Mediterranean.* Sophia Antipolis: EIB.

Hafner, Manfred; Tagliapietra, Simone; El Andaloussi, El Habib;. 2012. *Outlook for Electricity and Renewable Energy in Southern and Eastern Mediterranean Countries.* MEDPRO.

Hakura, Fadi. 2018. *EU-Turkey Customs Union: Prospects for Modernization and Lessons for Brexit.* London: Chatam House.

Heinrich Böll Stiftung. 2021. *The European Green Deal's fitness test - Will the EU's Fit-for-55 package ensure reaching the climate goal?* https://eu.boell.org/en/2021/07/07/fit-for-55.

International Energy Agency. 2022. *Data & Statistics.* https://www.iea.org/data-and-statistics/data-browser?country=EU28&fuel=CO2%20emissions&indicator=CO2Industry.

International Energy Agency. 2021. "Turkey 2021: Energy Policy Review."

Kaslowski, Simone. 2021. "TÜSİAD High Advisory Council."

Maratou, Alexandra. 2021. *EU Carbon Border Adjustment Mechanism and implications for Turkey.* European Roundtable on Climate Change and Sustainable Transition (ERCST).

Mazur, Anna, Zaur Phutkaradze, Georgia Jaba. 2015. "Economic Growth and Environmental Quality in the European Union Countries - Is there evidence for the Environmental Kuznets Curve?" *Intenrational Journal of Management and Economics.*

PBL Agency, Netherlands Environmental. 2017. *Trends in global CO2 and total greenhouse gas emissions: 2017 report.*

Republic of Turkey. 2009. *Climate Change Strategy 2010-2020.* Ankara: Ministry of Environment and Urbanization.

Republic of Turkey. 2021. "Greeb Deal Action Plan."

Republic of Turkey. 2016. "Intended Nationally Determined Contribution."

Republic of Turkey. 2021. "Turkey and the EU will continue to ccoperate on the issues of climate change and the environment."

Sartori, Nicolò. 2021. *EU-Turkey Relations: Theories, Institutions and Policies.* Bonn / Istanbul: Palgrave Macmillan.

Sartori, Nicolò, Lorenzo Colantoni, Dicle Korkmaz, Mirja Schroeder, S. Duygu Sever, and Suhnaz Yilmaz. 2017. *Energy and Climate Strategies, Interests and Priorities of the EU and Turkey.* FEUTURE.

Tagliapietra, Simone. 2017. *Energy Relations in the Euro-Mediterranean: A Political Economy Perspective.* Milan: Fondazione Eni Enrico Mattei.

Tagliapietra, Simone, and Georg Zachmann. 2016. *Energy Across the Mediterranean.* Brussels: bruegel policy brief.

Tastan, Kadri. 2022. *Decarbonising EU-Turkey Energy Cooperation: Challenges and Prospects.* Stiftung Wissenschaft und Politik.

Teias. 2019. *Turkey Electricity Production-Transmission Statistics.* https://www.teias.gov.tr/turkiye-elektrik-uretim-iletim-istatistikleri.

Togan, Subidey. 2012. *The EU-Turkey Customs Union: A Model for Future Euro-Med Integration.* MEDPRO.

TÜSİAD. 2016. "Ekonomi politikaları perspektifinden İklim değişikliği ile mücadele." Istanbul.

Union for the Mediterranean Secretariat. 2015. *Fostering regional dialogue on energy: 3 UfM platforms on Gas, Regional Electricity Markets and Renewable Energy and Energy Efficiency are launched.* https://ufmsecretariat.org/fostering-regional-dialogue-on-energy-launch-of-3-ufm-platforms-on-gas-regional-electricity-markets-and-renewable-energy-and-energy-efficiency/.

Weise, Zia. 2021. "EU's looming carbon tax nudged Turkey toward Paris climate accord, envoy says." *POLITICO PRO.*

Wikipedia. 2018. *Ouarzazate Solar Power Station.* https://en.m.wikipedia.org/wiki/Ouarzazate_Solar_Power_Station.

World Bank. 2014. "Evaluation of the EU-Turkey Customs Union."

Annexes

Figure 1.

Table 2 – EU energy and climate targets and related legislation

		GHG emission reduction	Energy efficiency	Renewable energy
EU climate and energy targets		Emission reduction compared to 1990 level	Reduction of energy consumption relative to projections	Share of renewables in final energy consumption
	Targets for 2020	**-20 %**	**-20 %**	**20 %**
	Targets for 2030	**-40 % / at least -55 %**	**-32.5 % / to be revised**	**32 % / to be revised**
	Targets for 2050	**Net-zero**		
EU climate and legislation	European climate law (proposal)	Binding targets for 2030 and 2050	Energy efficiency contributes to emission cuts	Emission-free energy supply
	ETS Directive	Cap on GHG emissions in specific sectors	ETS price drives efficiency improvements	ETS price raises cost of fossil energy sources
	Effort Sharing Regulation	Annual emission allocations	Efficiency contributes to emission cuts	Emission-free energy supply
	LULUCF Regulation	No-debit rule		
	Energy Efficiency Directive	Efficiency contributes to emission cuts	EU-wide binding target	
	Renewable Energy Directive	Emission-free energy supply enables emission cuts		EU-wide binding target
	F-gas Regulation			
	Energy Performance of Buildings Directive			
	Energy efficiency labelling			
	Ecodesign Regulation			
	CO_2 standards for new cars and vans			
	CO_2 standards for heavy-duty vehicles			
	Energy Union and Climate Action Governance Regulation	Over-arching framework		

Source: EPRS (green: direct contribution to targets; yellow: indirect contribution).

Source: (EPRS - European Parliamentary Research Service 2021)

Figure 2.

	EU top-five suppliers	Global top-five suppliers
Cement	Turkey (13%)	Vietnam (0.8%)
	Colombia (64%)	EU
	Ukraine (90%)	Turkey (13%)
	Belarus (30%)	Thailand (0%)
	Morocco (25%)	Canada (0.007%)
Aluminium	Norway (98%) Russia (56%)	China (11%)
	China (11%)	EU
	Switzerland (87%)	Canada (4.9%)
	United Arab Emirates (27%)	Russia (56%)
	Turkey (54%)	USA (7.3%)
Electricity	Switzerland (97%)	EU
	Russia (72%)	Canada (0%)
	Norway (99%)	Switzerland (97%)
	Serbia (78%)	China (0%)
	Ukraine (99%)	Paraguay (0%)
Fertilisers	Russia (9.2%)	Russia (9.2%)
	Algeria (38%)	China (0.04%)
	Egypt (28.5%)	EU
	Trinidad and Tobago (9%)	USA (0.5%)
	Ukraine (31%)	Morocco (0%)
Iron and Steel	Russia (20%)	China (1.8%)
	Turkey (23%)	EU
	Ukraine (27%)	Japan (0.5%)
	United Kingdom (31%)	Korea (6.1%)
	Korea (6.1%)	Russia (20%)

Source: UN COMTRADE, Own calculations.
Note: Iceland, Norway, Liechtenstein, and Switzerland are part of the EU ETS and will not be covered by the CBAM. Electricity is traded through physical interconnectors and therefore limited by geography.

Source: (Erixon 2021)

Figure 3.1 - Turkey

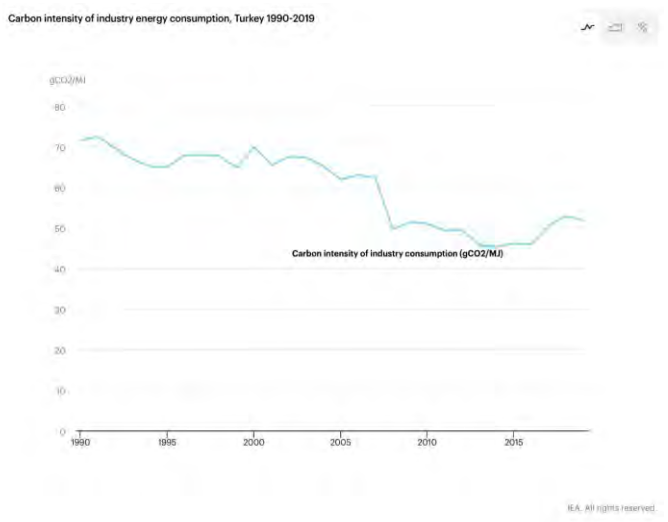


Figure 3.2 - Morocco

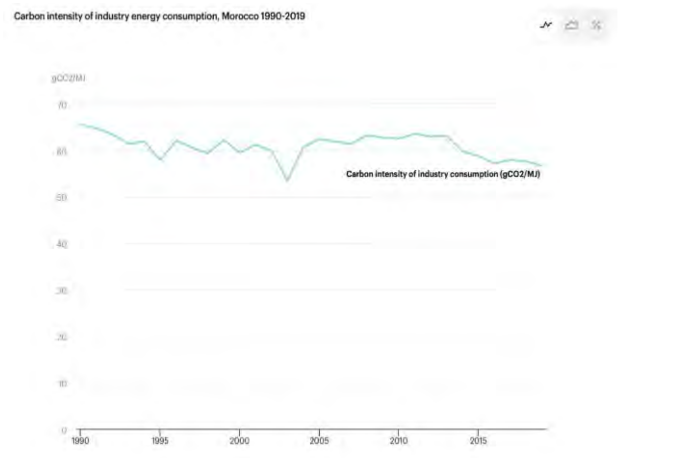


Figure 3.3 - Egypt

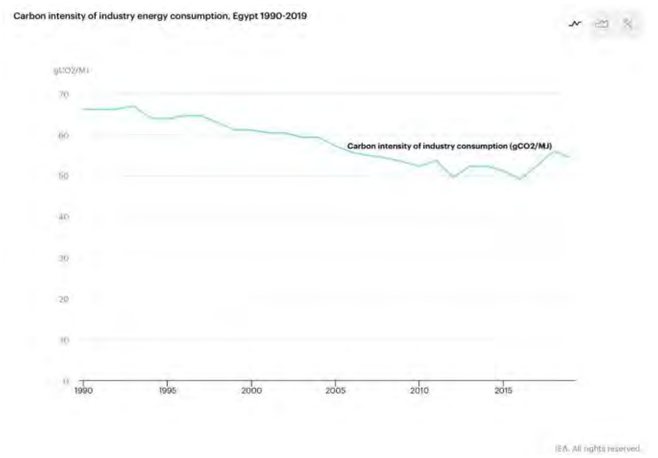


Figure 3.4 - Israel

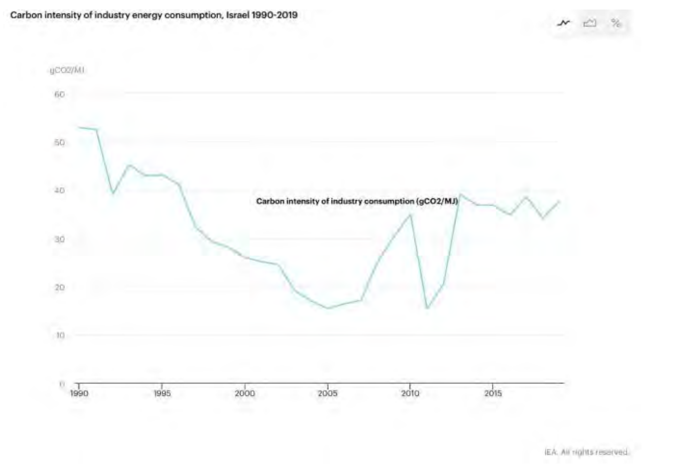
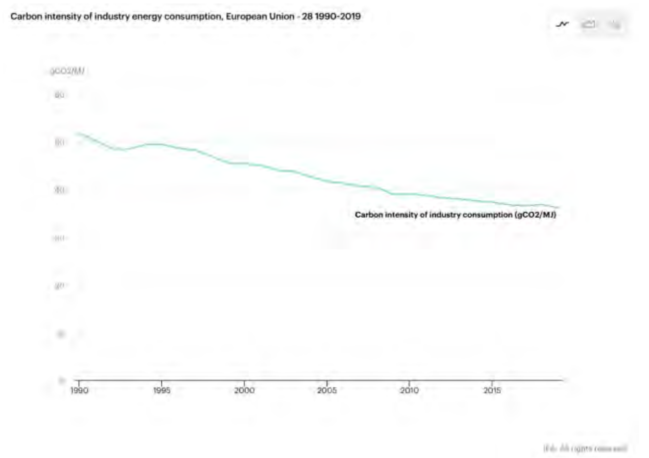


Figure 3.5 – European Union



Source: (International Energy Agency 2022)

Figure 4.

Table 4.4 Solar and wind energy capacity targets by technology in SEMCs

Country	Installed capacity targets by technology
Morocco	PV: 2,000 MW by 2020; Wind: 2,000 MW by 2020 ***Total: 4,000 MW by 2020***
Algeria	PV: 830 MW by 2020; 2,800 MW by 2030; CSP: 1,500 MW by 2020; 7,200 MW by 2030; Wind: 270 MW by 2020; 2,000 MW by 2030 ***Total: 12,000 MW by 2030 (+10,000 MW for export)***
Tunisia	PV: 1,500 MW by 2030; CSP: 500 MW by 2030; Wind: 1,700 MW by 2030 ***Total: 3,700 MW by 2030***
Libya	PV: 344 MW by 2020; 844 MW by 2025; CSP: 125 MW by 2020; 375 MW by 2025; Wind: 600 MW by 2020; 1,000 MW by 2025 ***Total: 2,219 MW by 2025***
Egypt	PV: 220 MW by 2020; 700 MW by 2027; CSP: 1,100 MW by 2020; 2,800 MW by 2027; Wind: 7,200 MW by 2020 ***Total: 10,700 MW by 2027***
Israel	PV: 1,750 MW by 2020; Wind: 800 MW by 2020 ***Total: 2,550 MW by 2020***
Palestinian Territories	PV: 45 MW by 2020; CSP: 20 MW by 2020; Wind: 44 MW by 2020 ***Total: 109 MW by 2020***
Jordan	PV: 300 MW by 2020; CSP: 300 MW by 2020; Wind: 1,200 MW by 2020 ***Total: 1,800 MW by 2020***
Lebanon	Wind: 400–500 MW by 2020 ***Total: 400–500 MW by 2020***
Syria	PV: 380 MW by 2020; 1,750 MW by 2030; CSP: 50 MW by 2030; Wind: 1,000 MW by 2020; 2,000 MW by 2030 ***Total: 3,800 MW by 2030***
Turkey	PV: 3,000 MW by 2023; Wind: 20,000 MW by 2023 ***Total: 23,000 MW by 2023***
SEMCs	***Total: 75,000 MW by 2030***

Source: Author's elaboration on UAE/IRENA/REN21 (2013a, p. 20), IRENA (2013) and Invest in Turkey (2014).

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

Figure 5

Table 4.5 Renewable energy agencies in SEMCs

Country	Agency	Year	Functions
Morocco	Moroccan Agency for Solar Energy (MASEN)	2010	Public-private agency created for the implementation of the Moroccan Solar plan and the promotion of solar resources in every aspect
Algeria	New Energy Algeria (NEAL)	2003	Agency established by the Algerian government and Algeria's national energy companies to encourage domestic production, use and export of renewable energy
Tunisia	National Agency for the Promotion of Renewable Energy (ANME)	2009	Agency established by the Tunisian government to encourage domestic production, use and export of renewable energy
Libya	Renewable Energy Authority (REAOL)	2007	Governmental institution created to implement renewable energy projects, increase the contribution of renewable energy in the mix and propose legislation to support renewable energy
Egypt	New and Renewable Energy Authority (NREA)	1986	Agency established to act as the national focal point for expanding efforts to develop and introduce renewable energy technologies on a commercial scale
Jordan	National Energy Research Centre (NERC)	1998	Center dedicated to research, development and training in the fields of new and renewable energy
Syria	National Energy Research Centre (NERC)	2003	Center established by the Ministry of Electricity to conduct studies on renewable energy and implement experimental pilot projects

Source: Author's elaboration on MASEN, NEAL, ANME, REAOL, NREA, NERC, NERC websites

Source: (Tagliapietra, Energy Relations in the Euro-Mediterranean: A Political Economy Perspective 2017)

Figure 6.

Table A3. Exports, Emissions, Carbon Costs, and Tax Rates (2018)

	Emissions (Mt CO2e)				Carbon Costs (million euros)		Revenues (million euros)	Tax Rates (Carbon Cost as a % of Revenues)	
	Scope 1	Scope 2	Scope 3	Total	EUA=30 Euros	EUA=50 Euros	Exports to EU28	CBA_30	CBA_50
AG: Agriculture	2.53	0.06	0.10	2.69	81	135	2057	4	7
MI: Mining	0.04	0.03	0.04	0.11	3	5	1093	0	0
FO: Food	0.22	0.13	1.04	1.39	42	69	2842	1	2
TE: Textiles	0.17	1.70	2.20	4.07	122	203	14853	1	1
OE: Other Economy	0.09	0.29	0.52	0.90	27	45	3585	1	1
PA: Paper	0.06	0.07	0.09	0.22	7	11	754	1	1
PE: Petroleum Prod.	0.07	0.01	0.02	0.09	3	5	369	1	1
CH: Chemicals	1.15	0.59	0.68	2.43	73	121	6468	1	2
CE: Cement	5.17	0.31	0.14	5.62	169	281	1280	13	22
IS: Iron-Steel	1.75	1.27	0.93	3.96	119	198	7121	2	3
MW: Machinery	0.99	1.38	2.65	5.02	151	251	15752	1	2
AU: Automotive	0.07	1.42	3.23	4.72	142	236	19669	1	1
EL: Electricity	0.20	0.00	0.01	0.21	6	10	58	11	18
CN: Construction	0.00	0.01	0.04	0.05	2	3	91	2	3
RT: Retail trade	0.00	0.00	0.00	0.00	0	0	0	.	.
TR: Transportation	3.08	0.03	0.09	3.20	96	160	2894	3	6
AT: Air Transport	0.30	0.13	0.32	0.75	22	37	2040	1	2
PS: Postal and Courier Serv.	0.00	0.00	0.00	0.01	0	0	24	1	1
AF: Accommodation and Food	0.00	0.00	0.00	0.00	0	0	0	.	.
PR: Professional Serv.	0.03	0.12	0.17	0.32	10	16	2321	0	1
FS: Financial and Real Estate Serv.	0.01	0.03	0.04	0.07	2	4	405	1	1
TS: Tourism	0.02	0.13	0.20	0.35	10	17	7339	0	0
ES: Education Serv.	0.00	0.00	0.00	0.00	0	0	0	.	.
HE: Health Serv.	0.00	0.00	0.00	0.00	0	0	0	.	.
Total	**16**	**7.7**	**12.5**	**36.2**	**1085**	**1809**	**91016**		

Source: (Atil Aşıci and Acar, Towards a Green Deal in Turkey: Potentials of EU-Turkey cooperation on the green transition 2021)

Figure 7.

	Scenario	Approach to calculating CBAM burden	Explanatory notes
No foreign carbon price crediting	(1)	$EUA_{CO2\ price} * EU_{CO2\ intensity}$	• Carbon price for imports to EU equals price of EU ETS allowances ($EUA_{CO2\ price}$) • Exporters emissions determined based on average CO_2 intensity of EU producers ($EU_{CO2\ intensity}$)
	(2)	$EUA_{CO2\ price} * nonEU_{CO2\ intensity}$	• Carbon price for imports to EU equals price of EU ETS allowances ($EUA_{CO2\ price}$) • Exporters emissions determined based on average CO_2 intensity in exporting countries (non$EU_{CO2\ intensity}$)
	(3)	$EUA_{CO2\ price} * \Delta_{CO2\ intensity}$	• Carbon price for imports to EU equals price of EU ETS allowances ($EUA_{CO2\ price}$) • Exporters pay for the part of average CO_2 intensity in exporting countries in excess to the average EU CO_2 intensity ($\Delta_{CO2\ intensity}$)
With foreign carbon price crediting	(4)	$\Delta_{CO2\ price} * EU_{CO2\ intensity}$	• Crediting for foreign carbon pricing policies (carbon tax or ETS), carbon price for imports equals the difference between EU ETS allowance price and carbon prices in exporting countries ($\Delta_{CO2\ price}$) • Exporters emissions determined based on average CO_2 intensity of EU producers ($EU_{CO2\ intensity}$)
	(5)	$\Delta_{CO2\ price} * nonEU_{CO2\ intensity}$	• Crediting for foreign carbon pricing policies (carbon tax or ETS), carbon price for imports equals the difference between EU ETS allowance price and carbon prices in exporting countries ($\Delta_{CO2\ price}$) • Exporters embedded in imports determined based on the average CO_2 intensity in exporting countries (non$EU_{CO2\ intensity}$)
	(6)	$\Delta_{CO2\ price} * \Delta_{CO2\ intensity}$	• Crediting for foreign carbon pricing policies (carbon tax or ETS), carbon price for imports equals the difference between EU ETS allowance price and carbon prices in exporting countries ($\Delta_{CO2\ price}$) • Exporters pay for the part of average CO_2 intensity in exporting countries in excess to the average EU CO_2 intensity ($\Delta_{CO2\ intensity}$)

Source: (Maratou 2021)