

The Saudi Green Initiative Facts and Perspectives

المبادرة السعودية الخضراء
حقائق وآراء

إعداد

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The Saudi Green Initiative: Facts and Perspectives

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Abstract

Energy security has become critical at global level due to increased political tensions. This has significantly increased the role of energy diversification programmes and sustainability initiatives. The progress that Saudi Arabia has made towards achieving greater energy efficiency and resilience in line with the goals of Saudi Vision 2030 is therefore particularly noteworthy. In this context, the Saudi Green Initiative includes very promising ideas for the exploitation of green and blue hydrogen and the further development of the nuclear energy programme, for which the geography of the region is particularly favourable. If these plans are implemented, Saudi Arabia will not only be able to meet its own needs, but could also become a major exporter of reliable and affordable energy in the future. Achieving energy transition and green targets will also create opportunities for innovation to develop renewable energy sources and modernise the existing support network, as well as to develop more efficient energy use by residential consumers, industry and transport. Riyadh intends to develop, produce and expand clean energy in the context of broad international cooperation. It has developed and is currently developing joint investments, research programmes and training in the Middle East and North Africa to become a leader in the region's energy transformation.

In this paper, the authors aim to present the essential elements of the Saudi Green Initiative, its achievements to date and its expected impact, with a particular focus on reducing carbon emissions, harnessing natural resources, using nuclear energy more efficiently and international cooperation to achieve these goals.

Keywords:

Saudi Arabia, Mohammed bin Salman, energy security and transition, climate action, blue and green hydrogen

المبادرة السعودية الخضراء... حقائق وآراء

الملخص

أصبح أمن الطاقة أمراً بالغ الأهمية على الصعيد العالمي بسبب التوترات السياسية المتزايدة. وقد أدى ذلك إلى زيادة دور برامج تنويع الطاقة ومبادرات الاستدامة بشكل كبير. وفي هذا الإطار، حققت المملكة العربية السعودية تقدماً ملحوظاً نحو تحقيق قدر أكبر من الكفاءة في استخدام الطاقة والمرونة بما يتماشى مع أهداف رؤية المملكة 2030. تتضمن مبادرة السعودية الخضراء أفكاراً واعدة لاستغلال الهيدروجين الأخضر والأزرق ومواصلة تطوير برنامج الطاقة النووية. بتنفيذ هذه الخطط، ستتمكن المملكة من تلبية احتياجاتها وستصبح أيضاً مُصدراً رئيسياً للطاقة وبأسعار معقولة في المستقبل. تحقيق أهداف التحول في مجال الطاقة سيخلق أيضاً فرصاً للابتكار لتطوير مصادر الطاقة المتجددة وتحديث شبكة الدعم الحالية، فضلاً عن تطوير آلية الاستخدام من قبل المستهلكين وقطاعي الصناعة والنقل. تعترم الرياض تطوير وإنتاج وتعظيم الطاقة النظيفة في سياق تعاون دولي. تنتوي المملكة عبر ضخ استثمارات ضخمة أن تكون رائدة في هذا المجال في الشرق الأوسط وشمال إفريقيا. تستهدف عبر هذه الورقة البحثية تقديم العناصر الأساسية للمبادرة، وإنجازاتها الحالية وتأثيرها المتوقع، مع التركيز بشكل خاص على الحد من انبعاثات الكربون، وتسخير الموارد الطبيعية، واستخدام الطاقة النووية بكفاءة أكبر، والتعاون الدولي لتحقيقها.

كلمات مفتاحية:

المملكة العربية السعودية، محمد بن سلمان، أمن الطاقة، العمل المناخي، الهيدروجين الأزرق والأخضر

1. Introduction

Rising temperatures and extreme weather events are already affecting quality of life and economic opportunities. Recognising this, and in order to enhance the Kingdom's growing regional and international role and reputation, in 2021 Crown Prince Mohammed bin Salman announced a dual green initiative - the local Saudi Green Initiative and the regional Middle East Green Initiative - which includes perspective environmental, energy transformation and sustainability programmes for a sustainable green future. But climate action is not just about cutting energy waste or greening the region. The drive towards climate neutrality can also be seen in the projects announced to transform and renew the energy sector, with increasing attention being paid to increasing the share of blue and green hydrocarbons - and not least nuclear energy - in the Saudi energy mix, rather than fossil fuels.

The aim of this study is to present the background to the vision for green renewal in Saudi Arabia, the objectives set and the projects launched to achieve them. Accordingly, the authors will discuss the current Saudi efforts to combat climate change, the economic benefits of more intensive use of blue and green hydrogen and nuclear energy, and the vision for the future, the steps to restore the natural environment, and the international cooperation to support these efforts.

2. Fight against climate change

The world's second largest oil producer, Saudi Arabia, which holds 16% of the world's identified oil reserves to date, has launched a comprehensive initiative to promote action to combat climate change, regional environmental challenges including high temperatures, low rainfall, dust storms and desertification, and environmental degradation. In this spirit, it has committed to increase the share of renewable energy in the national energy mix to 50% by 2030, or around 58.7 GW, while reducing its carbon dioxide equivalent emissions by 278 million tonnes per year.¹ The Saudi leadership aims to achieve this through a circular carbon economy (CCE) approach, the development of clean and renewable energy sources for domestic and international use, energy efficiency programmes, afforestation and conscious investment in industries known to have high emissions, such as manufacturing, construction, mining, tourism, transport and information technology.²

¹ If Saudi Arabia achieves its target of 50% of electricity generated from renewable energy sources by 2030, it is estimated that it could reduce its carbon emissions by 15%, or 44 million tonnes, by 2035. However, it is worth reflecting on this prospective vision, given that the country's electricity supply was still predominantly based on fossil fuels in 2021, when natural gas accounted for 61% of its energy mix and oil for 39%. (Bakr-Samaha, 2022; Kingdom of Saudi Arabia, 2021; Independent, 2022)

² The National Energy Services Corporation (Tarshid), for example, was set up specifically to encourage energy efficiency in government buildings and private sector investment in energy efficiency services. To reduce energy consumption, it has announced a major programme to retrofit a full range of public and government assets and facilities, covering

To realise this ambitious vision, the Kingdom wants to focus on preventing negative trends, regenerative development, nature conservation and sustainable practices. In addition to this, Riyadh has also committed to invest in carbon capture and recycling projects with the stated aim of removing 1,500 tonnes of carbon dioxide from the atmosphere every day. The main objective of the efforts is therefore to align the sustainable programmes of the Vision 2030 announced by Crown Prince Mohammed bin Salman in April 2016 to reduce the country's exposure to oil revenues and improve the quality of life of its population, which will be integrated with the roadmap for climate action, the Saudi Green Initiative, also launched by the Crown Prince in October 2021.³

The latter brings together environmental, energy transition and sustainability programmes to reduce emissions, green Saudi Arabia and protect the land and sea. To achieve all these goals, the Saudi leadership has launched 77 initiatives so far. The government has also established the National Renewable Energy Programme to maximise the country's renewable energy potential, a long-term strategic project to be implemented in parallel with Saudi Vision 2030 and the Saudi Green Initiative.

The urgency for an effective implementation of the programme is underlined by the fact that Saudi Arabia, which is highly vulnerable to climate change, was the ninth largest emitter of carbon dioxide from fossil fuels in the world, with 14.6 tonnes per capita in 2019, more than three times the global average of 4.5 tonnes, according to the World Bank and EU JCR 2020 report (Triollet - Alvarez Martinez, 2021; The World Bank, 2020). At the same time, barely 2% of the state's land is suitable for cultivation, while desertification, air pollution and water scarcity are a persistent problem. At the same time, the economic and industrial development of recent decades has led to a significant increase in domestic energy use, averaging 6% per year between 2000 and 2015, and this is expected to rise by 4-5% per year until 2030.⁴ In addition, the switch to cleaner energy would free up substantial reserves of crude oil, which could then be exported at world market prices, significantly increasing state revenues and providing a secure financial backing for the government's grandiose development plans.⁵

The Saudi leadership intends to take the first tangible steps to offset emissions by increasing the volume of public transport through the construction of rail lines and other low-carbon solutions. In parallel, the first hydrogen refuelling

110,000 government buildings, 35,000 public schools, 100,000 mosques, 2,500 hospitals and clinics, and 2 million street lights (Zawya, 2020).

³ For more details on the vision and objectives of the Saudi Vision 2030 strategic framework, based on the three pillars of energy security, economic growth and prosperity, sustainability and climate change, see: Kingdom of Saudi Arabia, n.d.

⁴ According to the US International Energy Agency, in 2020 the country, then with a population of around 34 million, was the 11th largest energy consumer on the planet. It was also thought-provoking that households accounted for around 40% of electricity consumption, with air conditioners responsible for more than two-thirds of this in a country where summer temperatures can rise to 50 degrees Celsius (England – Al-Atrush, 2022; Saudi Arabia, 2021).

⁵ Current estimates suggest that by increasing the share of renewable energy, Saudi Arabia could achieve net savings of up to \$130 billion by 2030 (England–Al-Atrush, 2022).

stations have already been commissioned and electric commercial vehicles and buses supplied by Hyundai Motor of South Korea are being tested for economic feasibility. The creation of manufacturing capacity for hydrogen fuel cell electric cars involving North American and European companies has also been considered.⁶ According to the International Energy Agency, these efforts, coupled with other initiatives, will enable a 60% reduction in carbon dioxide emissions in the region using clean hydrocarbon technology. In parallel, the Public Investment Fund intends to invest more than \$10 billion in qualified green projects by 2026, including renewable energy, clean transport and sustainable water management.⁷

In this context, the Saudi monarchy's declared goal is to achieve net zero greenhouse gas emissions from the combustion of mainly fossil fuels by 2060, ten years after the United States, but preferably ahead of China and Russia, and to achieve this it has announced an investment of more than \$180 billion.⁸ The Saudi Green Initiative therefore intends to put a strong emphasis on research, exchange of best practices and technological developments towards sustainability and more intensive use of green energy. The country is well placed to do this, not only in terms of its material reserves but also in terms of its natural resources. It has abundant natural gas for the production of blue hydrogen, and the solar energy resources and land needed to produce green hydrogen.

3. Blue hydrogen great power ambitions

With its favourable background, Riyadh has also looked at how it could become the world's largest hydrogen supplier while meeting its own needs. This was one of the reasons for the strategic target set in 2021 of producing 2.9 million tonnes of clean hydrogen per year by 2030 and 4 million tonnes of clean hydrogen - blue and green - per year by 2035 (Mirza, 2021). In this context, Energy Minister Abdulaziz bin Salman has already announced a \$110 billion project⁹ to develop the Jafurah gas field, estimated to have 200 trillion cubic feet of reserves, which will be used mainly to increase the volume of blue hydrogen production from 2024 (Martin–El Wardany, 2021). In parallel, the monarchy intends to gain an increasing market share in the coming decades in the form of blue hydrogen and especially blue ammonia¹⁰. Based on background and

⁶ For example, New York-based Hyzon Motors plans to build an assembly plant for electric trucks, while France-based Gaussin will build a plant for electric on-road and off-road vehicles (Nakano, 2022).

⁷ The Public Investment Fund has already closed its first green bond issue worth USD 3 billion on the first day of the Future Investment Initiative conference in Riyadh. On 25 October 2022, 1.4 million tonnes of carbon credits were successfully auctioned in the world's largest ever carbon credit sale (Arab News, 2022a; Arab News, 2022b).

⁸ At the same time, the Saudi Crown Prince stressed that, in parallel with these objectives, the Kingdom wishes to continue to play a leading role in strengthening the security and stability of global oil markets (Saba–Azhar–Rashad, 2021; Saudi Green Initiative, 2022).

⁹ Aramco has also considered the involvement of foreign investors in the implementation of the large-scale Jafurah project (Nair–Martin, 2021).

¹⁰ Ammonia produced from a combination of ammonia synthesis and carbon capture, recovery and storage of emissions.

experience, the potential is there and there is strong global demand for Saudi renewables.¹¹ Indeed, Saudi Aramco has already successfully delivered 40 tonnes of blue ammonia to Japan in September 2020, which, in addition to the supply chain feasibility, has clearly demonstrated the level of existing technology solutions that can provide cost-effective, scalable and low-emission solutions (Aramco, 2020). Less than half a year later, the Saudi state oil company signed a memorandum of understanding with Hyundai OilBank Co. in which the parties agreed that the South Korean side would take shipments of liquefied natural gas from Saudi Aramco, convert them into hydrogen and return the CO₂ emitted in the process back to Saudi Arabia (Arab News, 2022c).

This is coupled with a surge in global demand for fuel following the outbreak of the Russia-Ukraine war in February 2022. As a result of the changed circumstances, including efforts to replace gas from Russia to Europe, the value of LNG trade doubled in one year to more than \$450 billion (International Energy Agency, 2023). Saudi Arabia has therefore stepped up its cooperation with several European Union countries, and at the end of December 2022 signed a Memorandum of Cooperation with Japan in the fields of the circular carbon economy, coal recycling, clean hydrogen and fuel ammonia (Reuters, 2022a). Energy Minister Abdulaziz bin Salman most recently held talks with his British counterpart Grant Shapps in mid-January 2023 on the prospects for cooperation in the field of clean hydrogen, the development and domestication of technologies for carbon capture, transport and storage, the exchange of expertise and the development of relevant regulations and policies (Arab News, 2022d). Shortly afterwards, Aramco also announced that it would invest around \$100 billion in natural gas production in Saudi Arabia, a country with significant reserves. The extra reserves thus extracted will be used to meet increased local demand, mainly for export in the form of blue hydrogen, for which it is currently looking to acquire stakes in a local LNG plant in the US and Asia (Mathis-Stapczynski, 2023).

4. Increased use of green hydrogen

Green hydrogen from renewable energy sources could be a new industrial sector for Saudi Arabia. The country's geography is ideal for this, as much of it lies in the sunbelt and has large areas of flat land for solar panels. Intensifying the use of solar energy is therefore at the forefront of the government's ambitious National Renewable Energy Programme, which aims to add 15 GW of renewable energy to the country's energy capacity by 2022-2023, supporting the government's climate change objectives and economic diversification strategy.¹² To meet these ambitious targets, ACWA Power, a developer of power generation and desalination plants, has already connected the 300 megawatt

¹¹ Experts predicted as early as 2020 that, with favourable government policies, the cost of producing hydrocarbons could fall by less than a third, while revenues from their sale in global markets could reach \$700 billion a year by 2050 (Feder, 2020).

¹² One of the long-term targets of the National Renewable Energy Programme is to produce 40 GW of energy using green hydrogen by 2030, which is equivalent to two thirds of renewable capacity (Economist Intelligence, 2023).

Sakaka solar power plant, the country's first utility-scale renewable energy project, to the grid in November 2019 and actually commissioned it in April 2021, with the capacity to power 44,000 buildings (Bellini, 2019). It was also a landmark when Riyadh signed an agreement for seven solar projects with a total capacity of 3 gigawatts in April 2021, and in August 2021 the country's first wind farm, Dumat Al Jandal, which can power up to 70,000 households, started production (Reuters, 2022b; Al-Jazeera, 2021; Everill, 2023). In addition, the construction of futuristic cities such as NEOM has also begun.¹³ It is planned that the \$500 billion high-tech megacity will be powered by 100% renewable energy thanks to a joint venture between Riyadh-based ACWA Power and Pennsylvania-based Air Products. Once the \$5 billion green hydrogen project is operational, it will be the world's largest renewable hydrogen-to-ammonia facility with 4 GW of renewable capacity, capable of producing 1.2 million tonnes of green hydrogen per year.¹⁴ The first phase of the facilities is expected to be operational in 2025 and will cover a total of 10,000 square miles (Arab News, 2022e).

The Saudi Green Initiative represents a key investment opportunity for the private sector and a balanced long-term quality employment opportunity for workers, in addition to tackling the climate crisis and increasing the Kingdom's global market share. In the former context, the first wave of more than 60 initiatives presented at the Saudi Green Initiative Forum in October 2021 under the Saudi Green Initiative is worth mentioning, which alone represents an investment of USD 190 billion in boosting the green economy. For the latter, it is perhaps sufficient to refer to the view of the U.S.-Saudi Arabia Business Council that the Kingdom's renewable energy sector could create up to 750,000 additional jobs by 2030 if current priorities are maintained (Arab News, 2021).

5. Use of nuclear power

But despite the undoubtedly impressive financial investment, it will still take years before the energy produced from blue and green hydrogen can significantly mitigate the spectacularly growing demand. And the time factor is relevant in this respect, as it is projected that at the current rate of growth, energy demand, which has already reached 62.7 GW in 2019, is expected to exceed 120 GW by 2030, equivalent to only 50% of current energy supply (Malek, 2022). To complement its clean energy initiatives, Riyadh has also embarked on an ambitious nuclear energy programme to strengthen the country's energy security

¹³ NEOM is planned to consist of 10 projects, each named a region, of which details have been released on four so far. The first is The Line, 200 metres wide and 170 km long, which will be home to 9 million people. The second will be the octagonal port city of Oxagon in the southernmost part of the NEOM region. In the north, the 60-square-kilometre Tojena ski resort in the Sarwat Mountains is planned to host the 2029 Asian Winter Games. Lastly, the 840,000-square-metre Sindalah on the Red Sea, with its marinas and hotels, will be a yachting resort (Ravenscroft, 2023).

¹⁴ For comparison, it is worth noting that in energy terms, 1.2 million tonnes of green hydrogen per year is equivalent to about 5 million barrels of oil per year. The picture is further complicated by the fact that, even after reducing its crude oil production, the desert kingdom was still producing 10.38 million barrels of oil per day in January 2023 (Kern, 2023; Nakano, 2022).

and support sustainable growth. As part of the latter, the King Abdullah City for Atomic and Renewable Energies has already formulated plans for the nuclear industry, and in 2017 announced the Saudi National Nuclear Energy Project. This was followed by the launch of the Saudi Arabian Nuclear Energy Holding Company in the spring of 2022, while the construction of the country's first experimental nuclear reactor was already well underway.¹⁵ The process is currently at the stage where the Kingdom is ready to invite and negotiate substantial bids - currently with South Korea, France, China and Russia - for the construction of two pressurised water reactor power plants, which are expected to have a total capacity of 2.8 GW using domestic resources from the Jabal Saeed and Medina uranium deposits.¹⁶ In addition, the Minister of Energy, Prince Abdulaziz bin Salman, signed a Memorandum of Understanding in Riyadh with the French Foreign Minister Catherine Colonna in early February 2023 on the peaceful use of nuclear energy and the possibilities for future cooperation between the two countries in various energy fields (including renewable energy, clean hydrogen and electricity interconnection) (Trade Arabia, 2023).

However, the realisation of these ideas would not only provide a solution to meet the growing demand for energy on an ongoing basis, but the process used would also contribute significantly to the fight against global warming. By embracing nuclear energy, it is expected to create new learning, training and job opportunities in renewable and alternative energies, while at the same time increasing the diversification of energy sources and the use of nuclear energy for the production of hydrogen gas or even for desalination of seawater. The latter could be a particularly important aspect, given the projections that, taking the standard reference date, the country's water demand will be 7 million cubic metres per day by 2030, 3 million cubic metres more than current capacity.

6. Long-term plans and visions

The further development of this perspective process is well illustrated by the facts that while in 2020 Saudi Arabia produced less than 730 GWh from renewable energy sources, accounting for 0.2% of the country's electricity generation, by the third quarter of 2022, the Saudi National Renewable Energy Programme had 13 new renewable energy projects under development with a total capacity of 11.4 GW and an estimated investment value of \$9 billion (Bell, 2022). In addition, the launch of five new renewable energy projects - three wind and two solar - with a total capacity of 3,300 megawatts has been announced for September 2022 as part of the National Renewable Energy Programme (Abdelaziz, 2022). In addition to these, the Minister of Energy, Prince Abdulaziz bin Salman, announced three additional projects, including the establishment of a "Circular Carbon Economy Knowledge Centre" at the Saudi Green Initiative

¹⁵ The first nuclear reactor, whose foundation stone was laid by Crown Prince Mohammed bin Salman in the building of the King Abdulaziz City of Science and Technology, will in fact be a low-power research reactor to support training and research/development activities (Gornall, 2022).

¹⁶ Saudi Arabia to build 16 nuclear reactors by 2040 with a total investment of \$80 billion (Korea JoongAng Daily, 2022; Nova.news, 2023).

Forum at the COP27 conference in November 2022, and a greenhouse gas credit scheme planned for 2023.¹⁷ The Saudi government's decision to sign a joint development agreement with Saudi Aramco and its partners for the world's largest planned carbon capture and storage centre was also announced. The centre, located in Jubail Industrial City, will be operational by 2027 and will be capable of capturing and storing 9 million tonnes of CO₂ in its first phase (Gulf Business, 2022). They also plan to finalise the concept for the development of 10 additional renewable energy projects and to connect an additional 840 MW of solar PV to their grid in 2023 (Bell, 2022).

7. Regeneration of the natural environment

In addition to infrastructure investments, the Saudi side has a well-developed strategy to identify gaps in its environmental policy and develop nature-based solutions. A key element of this is the recognition that the regeneration of Saudi Arabia's natural habitats is the most effective solution to coastal erosion, while also providing a natural defence against climate change, as trees sequester five times more carbon than tropical forests. This was essentially the motivating force behind an effort to plant 10 billion trees and restore some 200 million hectares of degraded land in the country over the coming decades.¹⁸ Greening of urban areas and deserts is reported to be achieved by deploying cloud cover, recycling wastewater, and planting less irrigation-intensive tree species. Around 100 carefully selected indigenous and adaptable tree species are therefore grown in dedicated nurseries before being planted in 62 approved sites across the country to restore natural vegetation cover, protect biodiversity and bind soil to protect against dust storms (Saudi Gazette, 2022b). Of these, since the launch of the Saudi Green Initiative, more than 18 million trees have been planted, some 60,000 hectares of degraded land have been rehabilitated, and 17 new initiatives have been launched across the country to restore natural green spaces and combat the effects of climate change (Trade Arabia, 2022). Contributing to the 10 billion trees target, NEOM announced that 1.5 million hectares of land will be rehabilitated, and 100 million native trees, shrubs and medicinal plants planted by 2030 (NEOM, 2022).

In addition, 30% of the kingdom's territory - some 600,000 square kilometres - is to be declared a protected area, as part of a reintroduction programme to repopulate and care for depleted wildlife (Agonor, 2022). Meanwhile, coastal habitats are also being protected, with the creation of an institution to conserve coral reefs and protect the habitat of Red Sea turtles in order to protect marine biodiversity.

¹⁷ The Centre aims to promote international cooperation in the field of circular carbon technology and facilitate the sharing of information and best practices between public and private sector actors (Saudi Gazette, 2022a).

¹⁸ This target is equivalent to 4% of global efforts to reverse land degradation and 1% of efforts to plant one trillion trees (Agonor, 2022).

8. International cooperation

However, the Saudi Green Initiative is not limited to the desert kingdom. Riyadh intends to develop, produce, and expand green energy in the context of broad international cooperation. As part of this, Saudi Arabia has already joined the global initiative to reduce methane emissions by 30% by 2030, as set in 2020. It is also working with the UN Economic and Social Commission for Western Asia (ESCWA) to establish a regional centre to promote emission reductions, and with the UN Framework Convention on Climate Change to organise the next MENA Climate Week in 2023. Moreover, joint efforts on climate change are a stable point in the relationship between Saudi Arabia and the United States. This was demonstrated, for example, by the participation of President Biden's Special Envoy for Climate Change John Kerry at the first Middle East Green Initiative Summit in October 2021, where the participating states came together with the express purpose of establishing a regional pact to pool resources for the protection of common maritime, land and airspace (Azhar-Saba, 2021).

The Middle East Green Initiative, of which the Saudi Green Initiative is a part, provides an excellent platform for the Arab League states to take appropriate action against the negative impacts of fossil fuels. The initiative, also launched by Crown Prince Mohammad bin Salman in 2021, has a key objective of reducing regional carbon emissions by more than 60 percent. It also has a declared commitment to plant 50 billion trees in the Middle East and restore 200 million hectares of degraded land. This is projected to achieve a 2.5 per cent reduction in global carbon dioxide levels (Arab News, 2022f).

To achieve these objectives, Saudi Arabia has developed and is developing joint investments, research programmes and training in the Middle East and North Africa, which, alongside a deepening international partnership, will enable it to play a leading role in the region's energy transformation. The latter can be seen in regional initiatives such as the development of clean cooking fuel solutions or the establishment of a regional investment fund to finance technological solutions for the planned circular carbon economy, estimated to be worth \$10.4 billion, 15% of which will be financed by Saudi Arabia (Arab News, 2022b). At the COP27 climate change conference in Sharm el-Sheikh, Egypt, Crown Prince Mohammad bin Salman also announced that his country will contribute \$2.5 billion to the Middle East Green Initiative over the next 10 years, the headquarters of which are planned to be established in the kingdom. (Arab News, 2022f).

9. Conclusion

The goals of the Saudi Green Initiative, announced by Crown Prince Mohamed bin Salman, are not only bold and extraordinary, but border on the impossible. The country's green transition is now in full swing across all sectors and we are already seeing how the domestic consumption of clean hydrogen, for example in transport, is contributing to reducing the carbon profile of Saudi economic activity. To further unleash this process, billions of dollars are being invested from oil revenues in reforestation, green hydrogen, and carbon capture and reduction strategies. In addition to research and development, the initiative enjoys the highest level of support from the Saudi leadership, whose clear commitment to renewable energy, alongside climate protection regulations, is demonstrated by announced and ongoing financial commitments, large-scale initiatives and the construction of wind and solar power plants across the country.

Of course, there have also been criticisms of this undoubtedly forward-looking vision, with some climate experts accusing the Kingdom of deliberately misrepresenting the climate change narrative in order to blunt the edge of the fossil fuel divestment campaign. These comments, however, take a one-sided approach to the complex issue by overlooking - or at least ignoring - its economic and political dimensions. This overlooks fundamental factors such as the limited availability of fossil resources. It is debatable when the currently identified fields will be exhausted, but it is certain that they will not last forever. It is also clear that the Kingdom's main income comes from the sale of oil and gas reserves. It is therefore essential that other sources of income, preferably of similar magnitude, are found now, as development is expected to take decades even under the most optimistic expectations. This is not only a necessity, but also a constraint on the Saudi leadership, since one of the sure foundations of the monarchy at home is the maintenance of a high standard of living. While maintaining domestic stability, the foreign policy aspects are equally important, as the Middle East Green Initiative, for example, is not only about Saudi Arabia taking the lead, but also about strengthening its regional dominance. Ultimately, the monarchy can also become an advocate of the global energy transition by proactively selling clean hydrogen reserves to hydrocarbon-importing countries interested in low-carbon energy sources. In this context, it is perhaps sufficient to refer to the uncertainty of the long-term future of OPEC (Organisation of Petroleum Exporting Countries), in which Saudi Arabia currently plays a leading role. Indeed, the question is what changes the gradual depletion of fossil reserves and the fall in oil sales will bring to this organisation, which is the mainstay of the global economy, and which could range from a simple change of name to the dissolution of a grouping that is now a thing of the past.

The circumstances created by the external and internal dimensions have therefore, so to speak, already marked out a path for Saudi Arabia to follow. However, it is still early days in realising these ambitious goals. It would therefore be premature and inappropriate to judge the final results and effectiveness on the basis of current achievements.

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