





## SDG 7

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**Ensure access to affordable, reliable, sustainable and modern energy for all**


## A. Introduction

The Arab region has made significant progress in universalizing access to energy services. Yet limited renewable energy penetration and high primary energy intensity continue to challenge its transition to sustainable energy. Disparities in energy access among and within countries, particularly between rural and urban areas, pose additional obstacles to the goal of leaving no one behind. The lack of reliable, affordable and clean energy in some countries further underscores the urgency of accelerating efforts to meet SDG 7 “Affordable and green energy” targets by 2030.


Shocks emanating from the war in Ukraine have imposed new strains on the region’s energy systems, impacting the most vulnerable. Continued economic downturns, conflict, instability and supply chain disruptions have hindered progress in some countries. While the region remains overwhelmingly reliant on fossil fuels, recent advancements in policy frameworks and utility-scale renewable generation projects, including several world-leading facilities scheduled to become operational in the near future, demonstrate the potential for a transformative shift towards sustainability.

### What the data say


*Data included in this section are from the ESCWA Arab SDG Monitor, (accessed in December 2023).*




The **proportion of the population with electricity access** increased from 89 per cent in 2015 to 91 per cent in 2021. Significant disparities remain between the least developed countries (64 per cent) and middle-income and Gulf Cooperation Council countries (both at 100 per cent), as well as between rural areas (83 per cent) and urban areas (98 per cent).




The **proportion of the population relying on unclean fuels and technologies for cooking, heating and lighting** decreased from 14 per cent in 2015 to 12 per cent in 2021. Yet an alarming 49 per cent of the population continues to depend on unclean fuels and technologies in the least developed countries, compared to 0 per cent in the Gulf Cooperation Council countries and 1 per cent in the middle-income countries.



**Renewable energy** accounted for only 5.1 per cent of the Arab region’s total final energy consumption in 2020. This was the lowest share of any region globally and only around a quarter of the world average of 19.1 per cent.



**Installed renewable electricity-generating capacity per capita** increased by 55 per cent between 2015 and 2021, yet is still less than one fifth of the global average. A recent surge in renewable energy investments, however, suggests the potential for significant capacity growth in the near future.



**Energy intensity** decreased by just 1 per cent between 2015 and 2020, which is insufficient to reach the goal of doubling the rate of improvement in energy efficiency by 2030. It compares unfavourably to the 7 per cent reduction observed on average globally during the same period.







**International financial flows to Arab countries to support clean energy R&D and renewable energy production, including in hybrid systems, declined from a peak of \$2.7 billion in 2017 to just \$363 million in 2021. This staggering 87 per cent reduction outpaced the global average decrease of 60 per cent during the same period.**

For an up-to-date view of SDG 7 data at the national and regional levels and an analysis of data availability, please refer to the [ESCWA Arab SDG Monitor](#).



### Interlinkages

In the Arab region, the urgent need to address water scarcity (SDG 6), promote sustainable agricultural practices (SDG 2) and combat climate change (SDG 13) makes it imperative for policies to address the **water-energy-food-environment nexus**. For example, as countries turn increasingly to energy-intensive desalinated water and treated wastewater to enhance water availability, it is crucial to integrate renewable energy and energy efficiency into water policies.

Strong interlinkages also exist between SDG 7 and poverty eradication (SDG 1), good health (SDG 3), quality education (SDG 4), economic growth (SDG 8), industrialization (SDG 9), and responsible consumption and production (SDG 12), including the call to phase out harmful fossil-fuel subsidies.

## On the road to 2030 – suggested policy approaches to accelerate progress on SDG 7

- Increase investment in clean energy access, including off-grid solutions, particularly in rural areas, least developed and conflict-affected countries.
- Enhance the security of the electricity supply by expanding installed generation capacity, strengthening transmission networks and improving service reliability.
- Accelerate clean cooking access in the least developed countries by scaling up behaviour change strategies, offering context-specific options (considering fuel availability, affordability and cultural preferences), and investing in the local production and distribution of clean cooking solutions.
- Transition from fossil-fuel subsidies to targeted assistance to those most in need, while providing technical assistance and capacity-building to ensure that energy-poor households have access to electricity and clean cooking technologies. Moreover, enhance subsidy governance through innovative tools such as smart cards and micropayment schemes.



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and fostered rural development. **Morocco** stands out for exhibiting the greatest improvement in rural electrification in the region in the last two decades, driven by the successful implementation of its Global Rural Electrification Programme.

While Gulf Cooperation Council and middle-income countries have achieved universal or near-universal access to modern energy, the least developed countries and some conflict-affected countries continue to face significant electricity access deficits, ranging from 17 per cent of the rural population in the **Comoros** to as much as 51 per cent in **Somalia** and 52 per cent in **Mauritania**.

Electrification has the potential to reduce gender inequality by freeing up women's time from household chores, increasing the likelihood that they will work outside the home, making it easier for them to travel to work and providing new employment opportunities in electricity-powered businesses.

**Despite electricity access reaching 91 per cent of the Arab population in 2021, on par with the world average, a significant portion faces energy security challenges due to issues of reliability and affordability.**

Service disruptions are still prevalent in several countries, particularly those affected by conflict or hosting large refugee populations. The lack of reliable access to electricity imposes high social and economic costs in several countries, affecting both those with deficits in electricity access and those with universal electricity access, such as **Iraq** and **Lebanon**. In the latter group of countries, grid-supplied electricity falls short of providing uninterrupted 24-hour coverage, compelling citizens and businesses to resort to costly, noisy and polluting private fuel-based generators. The unreliability of electricity provision disproportionately impacts persons living in poverty, effectively excluding them from electricity services due to high costs associated with private generators.

Access to electricity grids does not guarantee power supplies. The capacity to operate and manage energy infrastructure is crucial to deliver reliable energy services to citizens and businesses.

- ◆ In **Egypt**, the Integrated Sustainable Energy Strategy 2035 was launched in 2015 to address widespread electricity shortages that were forcing electricity utilities to conduct rolling blackouts across the country. The strategy aims to boost electricity generation by using a combination of energy sources, prioritizing renewables but including fossil fuels and nuclear energy. Through large investments in 26 new power stations, the daily power generation capacity of Egypt more than doubled, surging from 23,000 megawatts in 2015 to 51,000 megawatts in 2021, allowing the country to become a regional power exporter. Concurrent efforts have strengthened the transmission network through the addition, replacement and renovation of overhead lines and transformer stations. Furthermore, Egypt is engaged in electrical interconnection projects with Cyprus, Greece, **Saudi Arabia** and the **Sudan**, positioning the country to potentially serve as a regional energy hub.
- ◆ In **Morocco**, the Global Rural Electrification Programme, launched in the mid-1990s, has yielded remarkable results, increasing the proportion of the rural population with access to electricity from 22 per cent in 1996 to over 99.9 per cent in 2021. The programme leveraged diverse electrification strategies, prioritizing decentralized renewable solutions, notably solar photovoltaic systems, in conjunction with public-private partnerships established under long-term concession contracts. In its latest tranche (2019 to 2023), the programme aimed to extend its coverage to 1,270 additional villages, benefitting 30,900 households, thereby projecting a rural electrification rate of 99.93 per cent. Despite the delayed entry of Morocco into rural electrification, with only 44 per cent of its rural population having electricity access in 2000, compared to 96 to 97 per cent in **Algeria**, **Egypt** and **Jordan** and 87 per cent in **Tunisia**, the country swiftly caught up, achieving universal rural coverage even ahead of some countries that had an earlier advantage.



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◆ **Historically, countries subsidized energy prices to ensure universal affordability and promote growth. However, some are phasing out these subsidies due to their growing fiscal burden.** The surge in energy consumption across the region in recent decades has made these subsidies unsustainable, particularly amid rising debt and fiscal constraints. Balancing the need for affordable energy access, particularly for low-income and vulnerable populations, with the requirement for sustainable energy policies, poses a significant challenge for the region.

Keeping regulated energy prices below market cost for many decades has distorted market signals for energy users, leading to inefficient and wasteful consumption habits.

Several countries, including **Algeria, Egypt, Jordan, Morocco, the Sudan and Tunisia** as well as the **Gulf Cooperation Council countries**, have embarked on fossil-fuel subsidy reforms over the past decade. These reforms have often involved replacing subsidies with enhanced social safety nets and increased budget expenditures on education and health care. For instance, **Morocco** discontinued some major fuel subsidies in 2013 while simultaneously expanding a national conditional cash transfer programme and a health insurance scheme.

Subsidy reductions, while beneficial for fiscal relief and promoting energy efficiency, can disproportionately affect energy access for disadvantaged communities, particularly people living in poverty. These cuts often lead to higher energy expenses for the lowest-income groups, indicating the need for pricing policies that consider inequality to ensure basic energy needs are met for all. Achieving sustainable energy equity in the region calls for targeted subsidies, technical assistance and capacity-building to ensure that energy-poor households, particularly in rural areas, have access to electricity and clean cooking technologies.

Energy pricing policies should be aligned with wider socioeconomic objectives to enable just and sustainable energy transitions that leave no one behind.

Potentially negative consequences of energy price reforms on vulnerable groups should be mitigated through complementary policies.

Affordability remains an issue in many countries, particularly those with some of the highest energy costs in the world, such as the **Comoros and Somalia**. Due to inadequate infrastructure and regulatory frameworks, supplies are highly fragmented and therefore inefficient.

For more on social protection programmes, see the chapter on SDG 1, and for more on fossil-fuel subsidies, see the chapter on SDG 12.

◆ **Morocco** initiated a substantial subsidy reform in 2013, reducing fuel subsidy spending from 5.3 per cent of GDP in 2011 to 1.1 per cent in early 2015. Subsidies for gasoline, diesel and fuel oil were completely eliminated. The reform resulted in annual fiscal savings of about \$3 billion relative to 2011. Subsidy removal has increased domestic energy prices: between 2011 and early 2015, gasoline and diesel prices rose by 25 per cent and 35 per cent, respectively. To mitigate the impact of rising energy bills on low-income households, Morocco expanded existing social safety nets, such as the *Tayssir* conditional cash transfer programme and the RAMEH health insurance scheme. While the removal of subsidies on fuel oil used in electricity generation implied higher electricity prices, the lowest consumption bracket, with a monthly use of less than 100 kilowatt-hours, remained exempt from tariff increases. These pro-poor reforms eliminated regressive subsidies, with a minimal direct impact on the poorest 20 per cent of the population. Morocco has also pursued ambitious renewable energy targets, emphasizing coherence in its energy policy.



◆ **All countries have set targets or enacted policies to promote renewable energy, with a strong focus on the power sector.** In most countries, these targets are aligned with mitigation commitments in nationally determined contributions under the Paris Agreement on climate change. Notably, the number of countries with official renewable energy targets rose from 4 in 2010 to 12 in 2015 and 22 in 2023. Most national targets remain legally non-binding, however. Moreover, only 8 out of the 17 Arab countries surveyed by the World Bank's Energy Sector Management Assistance Program<sup>1</sup> (**Bahrain, Egypt, Jordan, Oman, the State of Palestine, Saudi Arabia, Somalia, and the United Arab Emirates**) have developed action plans or strategies to achieve renewable energy targets.

**The power sector is the predominant focus of renewable energy targets and policies.** Notably, all 22 countries have set specific targets for the use of renewables in electricity generation. The **Comoros** and **Djibouti** have the most ambitious renewable power targets in the region, with both aiming for 100 per cent renewable electricity generation by 2030. They are followed by **Mauritania, Morocco** and **Saudi Arabia**, which seek a share of 50 to 52 per cent. Several countries have enacted policies to encourage renewable power generation. For instance, all 17 surveyed countries allow private sector ownership of renewable energy generation, 12 countries<sup>2</sup> offer long-term power purchasing agreements<sup>3</sup> to renewable electricity producers (typically via feed-in tariffs or auctions), and 9 countries<sup>4</sup> provide prioritized access to the grid for renewable energy. However, only a few countries, including **Algeria** and the **Syrian Arab Republic**, offer direct fiscal incentives – such as tax incentives or capital subsidies – for renewable electricity.

Despite exceeding expectations globally in the past decade, renewable energy faces several obstacles, such as challenges within supply chains for critical materials, the limited availability of suitable land, inadequate grid infrastructure investment, slow permitting processes and profitability concerns.<sup>a</sup>

Another emerging challenge pertains to the waste generated by renewable energy systems, specifically decommissioned wind turbine blades and solar panels that have reached the end of their operational life.

<sup>a</sup> McKinsey, 2023.

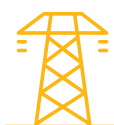
**The integration of renewables in end uses has received less policy attention compared to renewable power.** Only a few countries (6 of 17) have targets for integrating renewables into heating and cooling systems (**Algeria, Lebanon, Morocco, Oman, Tunisia and Yemen**). Even fewer (5 of 17) have developed policies to foster the utilization of renewable technologies for heating and cooling purposes (**Algeria, Lebanon, the State of Palestine, Tunisia and Yemen**).<sup>5</sup> In the transportation sector, only a few countries (4 of 17) set renewable energy deployment targets (**Lebanon, Oman, Qatar and the United Arab Emirates**). A larger number of countries (8 of 17) have introduced policies to promote renewable-powered transportation modes, such as electric vehicles (**Bahrain, Egypt, Lebanon, Morocco, Oman, the State of Palestine, Qatar and the United Arab Emirates**).

**Despite progress in the adoption of renewable energy targets in the power sector, renewable energy use remains low in most countries.** In 2021, renewables accounted for only 5.1 per cent of the region's total final energy consumption, of which 4.6 per cent was due to non-modern renewables (primarily solid biofuels) and only 0.5 per cent to modern renewables (mostly solar and wind). Notably, renewables accounted for only 0.1 per cent of total final energy consumption in Gulf Cooperation Council countries.

Arab countries, especially those with existing steel, electrical and mechanical industries, should define national plans for renewable energy equipment manufacturing, including local concentrated solar power and wind components. They should also conduct feasibility studies based on local manufacturing capacities and skills sets, seeking to create employment opportunities, particularly for young people.

As of 2022, countries had collectively reached only 9 per cent of their targeted renewable electricity capacity for 2035.<sup>6</sup> This represents the lowest achievement rate globally, with other regions in 2021 having achieved between 30 and 87 per cent of targeted renewable capacity set for 2030.<sup>7</sup> Considerable efforts are needed to bridge the remaining 91 per cent gap in the region by 2035.

For more on policy approaches to climate action, see the chapter on SDG 13.





Some countries are beginning to translate targets into binding legislation, build bankable projects, and secure dedicated funding to meet renewable energy targets and accelerate the transition to clean energy.

- ◆ **Saudi Arabia** has made significant strides in integrating renewable energy into its energy policy framework, aligning with its broader objectives of reducing fossil fuel dependence and diversifying the energy mix. The country set its renewable power target under the National Renewable Energy Program (2017) and created a regulatory framework for renewable energy projects through the Renewable Energy Projects Development Regulations (2018). Additionally, Saudi Arabia updated its Grid Code in 2020 to incorporate new regulations for handling renewable energy variability, ensuring grid reliability with high renewable energy penetration. As of 2021, the country also offers long-term power purchasing agreements for renewable energy projects, providing developers with secure prices for their electricity over extended periods, typically 20 to 25 years. While the renewable energy share of electricity in Saudi Arabia remained at 0.1 per cent between 2018 and 2021, recent policy changes are expected to have a significant impact on advancing renewable energy development in the country.
- ◆ The Solar Promotion Programme of **Tunisia**, launched in 2005, provides a 20 per cent capital cost subsidy for residential solar water heaters and low-interest loans facilitated through commercial banks. Utilizing electricity bills for repayments, with the State-owned utility as a debt collector and guarantor, this innovative approach bolstered the solar water heater market. By 2010, installed capacity surged fivefold, reaching 119,000 systems. Not only has the programme enhanced energy independence, but it has also curbed fossil-fuel subsidies, resulting in substantial long-term savings for the Government. Moreover, the programme has fostered job creation and environmental benefits by mitigating oil consumption and greenhouse gas emissions. Key to its success are training programmes, accreditation schemes and the involvement of the Tunisian National Agency for Energy Conservation in programme design and implementation. This experience underscores the potential for leveraging public resources, including utilities, to support renewable energy investments and steer demand away from conventional energy sources.<sup>8</sup>

◆ The region has made progress in adopting energy efficiency policy frameworks, yet lacks specific policies targeting critical energy-consuming sectors – such as buildings and transportation. As of 2021, 16 of 17 countries had adopted energy efficiency action plans or legal frameworks, a significant increase from 5 in 2010 and 11 in 2015.<sup>9</sup> Additionally, these 16 countries have also established national energy efficiency targets. More needs to be done, however, to develop and implement energy efficiency policies tailored to key energy-consuming sectors, such as buildings and transportation. Some countries (9 of 17) have mandatory energy efficiency ratings for buildings and/or labelling systems.<sup>10</sup> Only five have established heating and/or cooling strategies to guide building performance aspirations.<sup>11</sup> **Jordan** and the **State of Palestine** are the only two countries out of 17 to have national standards or regulations for near-zero energy buildings.

Price is a key factor influencing energy demand. In particular, artificially low energy prices can hinder the effectiveness of energy efficiency policies.

Moreover, price signals have a crucial role in attracting private investments in energy efficiency. To expedite their energy efficiency efforts, countries need to advance in the gradual rationalization of energy prices.

In the transportation sector, only five countries (**Jordan, Kuwait, Morocco, Qatar** and the **United Arab Emirates**) report having a mandate or incentive programme to support shifts to electric vehicles for personal use. Moreover, three countries (**Egypt, Morocco** and the **State of Palestine**) report providing public transit subsidies for consumers, one country (**Morocco**) has supported a car-sharing programme, and one country (**United Arab Emirates**) has a programme to support bicycle or other non-motorized schemes. This sluggish progress has resulted in significant liabilities, including large stocks of energy-inefficient vehicles. The lack of public transport infrastructure contributes to the rising reliance on motor vehicles in many countries, driving up regional fuel consumption and disproportionately affecting vulnerable groups, including the poor and women. These groups often struggle to afford purchasing and maintaining a car, which limits their mobility and restricts their ability to access education, health care, employment and other opportunities. In countries where public vehicle fleets do exist, low energy efficiency levels divert public resources towards fuel costs rather than investments in better transport infrastructure.

When it comes to setting minimum energy performance standards, equipment types that receive the highest priority in the region are heating and cooling systems, lighting equipment and refrigerators. Notably, 12 of 17 countries have established standards for heating and cooling systems,



10 for lighting equipment and 9 for refrigerators. In contrast, only 4 of 17 countries have such standards for industrial electric equipment and two for light vehicles. Alarming, only about half of countries with minimum energy performance standards have established penalties for non-compliance. The limited reach of energy performance standards, the rare imposition of penalties and insufficient enforcement of regulations across the region have heightened energy intensity in regional economic growth.

◆ **Countries are increasingly delving into clean hydrogen and its derivatives as alternative energy carriers but with a notable absence of regulations and incentives to drive these initiatives.** Clean energy solutions have potential to leverage the region's abundant natural gas resources, aided by carbon capture and storage, as well as its vast renewable energy potential for green hydrogen production. Clean hydrogen presents an opportunity to diversify export earnings, cut energy-related emissions, and enhance environmental and economic resilience. While several countries, including **Egypt, Mauritania, Morocco, Oman, Saudi Arabia** and the **United Arab Emirates**, have clean hydrogen projects in various stages of development (box), comprehensive legal and regulatory frameworks for low-carbon hydrogen production are still lacking. The **United Arab Emirates** took a step forward with the adoption of a national hydrogen strategy in 2023.

High water requirements can hinder green hydrogen production in regions already facing water scarcity. Desalination offers a potential solution, but its energy demand and cost require careful evaluation within local contexts.

Countries equipped with robust seawater desalination industries possess the expertise to offset water usage concerns when expanding for green hydrogen production. By scaling up desalination with a focus on green hydrogen, they could create a win-win situation, both contributing to clean energy goals and enhancing water security for their communities.

◆ The National Hydrogen Strategy 2050 of the **United Arab Emirates** aims to scale up clean hydrogen production to 1.4 million tons per year by 2031 and 15 million tons per year by 2050. This ambitious, multipronged approach focuses on building a robust regulatory framework, fostering a strong supply chain, creating a dedicated national R&D centre for hydrogen technologies, and promoting collaboration to create a regional hydrogen market. The strategy is a crucial tool to meet the country's 2050 net-zero commitment and the objectives of the Paris Agreement, especially by tackling emissions reductions in hard-to-abate sectors, such as transport, chemicals, fertilizers and metals.<sup>12</sup>

### Examples of clean hydrogen projects in selected countries

**Egypt** signed at least 16 memoranda of understanding in 2022 to develop green hydrogen and green ammonia production in collaboration with regional and international partners. The Ministry of Planning and Economic Development estimates that total investment in hydrogen infrastructure in the country may reach \$500 billion in 2030 and create 7 million direct and indirect jobs by 2050.

**Mauritania** entered into a memorandum of understanding with partners from Germany, **Egypt** and the **United Arab Emirates** to develop a \$34 billion, 10-gigawatt green hydrogen project. Scheduled for completion by 2028, this initiative has the potential to produce up to 8 million tons of green hydrogen and derivatives annually. It is set to begin its first phase, positioning Mauritania as a key player in the global clean energy transition.

The National Strategy for an Orderly Transition to Net Zero of **Oman** relies heavily on clean hydrogen and carbon capture and storage technologies to achieve decarbonization by 2050. To materialize this vision, the Government took a pivotal step in 2022 by establishing Hydrogen Oman (HYDROM), a State-owned enterprise tasked with spearheading and overseeing the implementation of hydrogen projects. The first six projects, worth \$20 billion and boasting a planned capacity of 15 gigawatts, were awarded in March 2023. Project agreements span 47 years, ensuring stability and long-term commitment. The development and construction phase is slated for seven years, followed by 40 years of operation.

**Saudi Arabia** is developing an \$8.4 billion green hydrogen facility in Neom, targeting an annual production of 219,000 tons of hydrogen and 1.2 million tons of ammonia. With construction well underway, the facility is anticipated to be the first to produce green hydrogen at scale upon completion in 2026.

**Sources:** Hamdy, 2022; Egypt, State Information Service, 2022; Morsy, 2022; Alkousaa and Heine, 2023; Oman, 2022 (for more on the strategy, see the chapter on SDG 13); IEA, 2023; [Neom Green Hydrogen Company](#).



## C. Policy trends by subregion

While the pursuit of SDG 7 shows overarching trends, subregional nuances reveal varying realities. In middle-income countries, these general patterns manifest clearly. Among the least developed and Gulf Cooperation Council countries, distinct subregional dynamics emerge. Conflict-affected countries require context-specific strategies. Recognizing these variations is vital for crafting effective and equitable solutions for achieving access to affordable, reliable, sustainable and modern energy for all.

### 1. Arab least developed countries

Only 64 per cent of the population in Arab least developed countries had access to electricity in 2021, with important differences between rural (52 per cent) and urban areas (85 per cent). All countries in this group, except **Yemen**, derive a large share of total final energy consumption from renewables. Their average share of renewable energy in total final energy consumption is three times higher than the global average. This is almost exclusively due to traditional renewables, primarily solid biofuels. A high proportion of their population relies largely on polluting fuels and technologies for cooking, heating and lighting.

◆ **Rural electrification and off-grid access policies are key priorities for most least developed countries, given their sizable electricity access deficits.** Mini-grids and solar home systems have gained recognition as practical solutions for extending electricity access in targeted geographical areas, particularly in rural and remote communities. However, the lack of comprehensive regulations and incentives has posed challenges in attracting investment in some countries.

- ◆ Although **Mauritania** has identified access to energy as a key development priority in various strategic documents, from its Poverty Reduction Strategy Paper (various editions) to the Accelerated Growth and Shared Prosperity Strategy, it did not have a national electrification plan as of 2021.<sup>13</sup> The Production and Transmission Master Plan (2011) was the only technical document setting priorities for the power sector, focusing mostly on interconnecting and expanding the current network while identifying opportunities for increasing local production and transmission, including through off-grid solutions in remote areas.<sup>14</sup> Little progress has been achieved in the last few decades. The proportion of the rural population with access to electricity fell from 3 per cent in 2000 to 0.8 per cent in 2012 (the latest year with available data in the *ESCWA Arab SDG Monitor*). This is among the lowest rates in the world, highlighting the critical need for a comprehensive strategy.
- ◆ As of 2021, **Somalia**, the **Sudan** and **Yemen** had each developed national electrification plans but

comprehensiveness varied. Only the plans of **Somalia** and the **Sudan** include specific electrification access targets, incorporate off-grid solutions and encourage private sector financing. In contrast to **Mauritania**, the **Sudan** has made significant progress in rural electrification in the last two decades. The proportion of the rural population with access to electricity increased from 4.4 per cent in 2000 to 24 per cent in 2012 and 49 per cent in 2021.

- ◆ **Replacing wood and charcoal stoves with clean fuels and advanced technologies for cooking, heating and lighting is considered a policy priority in most least developed countries.** These countries are increasingly adopting policies or targets for clean cooking. The **Comoros**, **Djibouti**, **Mauritania**, **Somalia** and the **Sudan** have included measures to scale up access to clean cooking solutions in their nationally determined contributions. The proportion of the population primarily reliant on clean fuels and technologies in the least developed countries has more than doubled over the past two decades, rising from 23 per cent in 2001 to 37 per cent in 2011 and reaching 51 per cent in 2021. Nevertheless, the subregional average still lags significantly behind the averages for the region (88 per cent) and the world (71 per cent). Substantial progress is essential to bridge this gap.<sup>15</sup>
- ◆ The national plan of the **Sudan** to scale up access to clean cooking solutions includes a targeted awareness-raising strategy to drive adoption, with tailored messages for both men and women, including on health. The plan does not set a goal of reaching universal access to clean cooking, however, nor does it set efficiency standards or adopt labelling schemes for clean cooking solutions. Importantly, the Government tracks household-level data on cooking solutions and provides duty and tax incentives for suppliers. The country's updated nationally determined contribution sets a goal of replacing traditional inefficient wood stoves with improved cookstoves for 20 per cent of the rural population. This transition, coupled with associated biomass savings, is expected to result in a reduction of 2.6 million tons of carbon dioxide-equivalent emissions by 2030.<sup>16</sup>



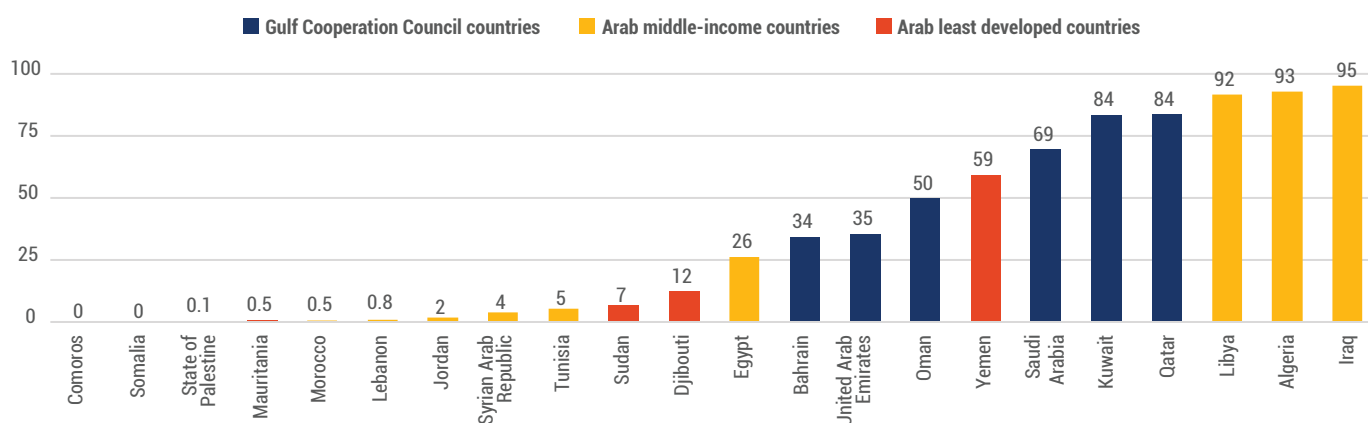
## 2. Gulf Cooperation Council countries

Gulf Cooperation Council countries boast significant hydrocarbon production and processing operations, with large portions of GDP and exports tied to the hydrocarbon industry (figure 7.1). In addition, their economies and societies are highly energy intensive. While these countries derive minimal shares of total energy consumption from renewables (figure 7.2), they are home to some of the lowest-cost utility-scale solar photovoltaic systems on Earth. Although installed renewable energy-generating capacity per capita increased 15-fold between 2015 and 2021, it was still only a quarter of the global average. Gulf Cooperation Council countries achieved universal access to electricity prior to 2000.



**Figure 7.1**

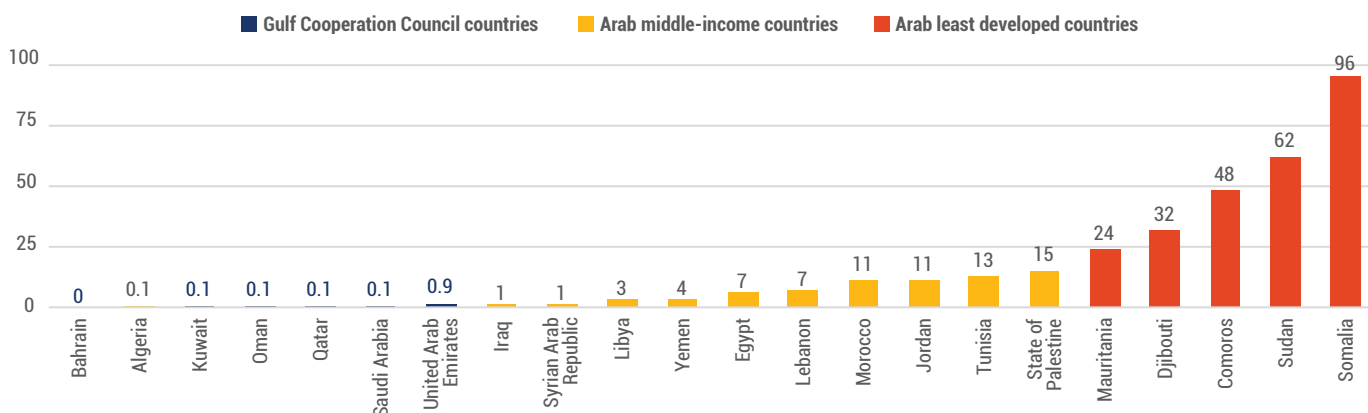
Share of hydrocarbons in total export revenues, 2019–2021 (Percentage)



Source: UNCTAD, 2023.

**Figure 7.2**

Share of renewable energy in total final energy consumption, 2020 (Percentage)



Source: ESCWA Arab SDG Monitor.

◆ **Gulf Cooperation Council countries are increasingly prioritizing the localization of their renewable energy sectors** by supporting national companies, incentivizing the private sector to manufacture renewable energy components and provide services locally, and encouraging both the public and private sectors to rely on local providers.

◆ In **Saudi Arabia**, to support Saudi Vision 2030's goal of indigenizing renewable energy sectors, the National Transformation Programme 2020 sought to increase the percentage of local content in the total expenditure of the public and private sectors to 50 per cent by 2021, and to raise the percentage of private sector jobs localization to 24 per cent by the same year.

◆ **Gulf Cooperation Council countries are seeking to optimize the use of available hydrocarbon resources.** While they have set renewable energy targets, there is also a concerted effort to expand fossil fuel production and bolster downstream industries.

◆ In **Bahrain**, the National Development Strategy (2015–2018) emphasizes the assessment and further development of hydrocarbon assets to maximize economic benefits over their lifespan. This entails employing enhanced recovery techniques for existing reserves and conducting exploratory drilling to identify new sources of supply.

◆ In **Saudi Arabia**, the National Transformation Programme 2020 sought to create 12,000 jobs in the hydrocarbon and minerals sectors in less-developed regions, as well as to attract 28 billion Saudi riyals in private sector investment in these sectors and regions.

◆ **Most Gulf Cooperation Council countries are promoting or striving to promote a carbon circular economy, including through carbon capture and storage.** Several countries, including **Bahrain, Kuwait, Saudi Arabia** and the **United Arab Emirates**, have incorporated carbon capture and storage measures in their nationally determined contributions.

◆ Despite having large-scale carbon capture and storage facilities in operation, **Saudi Arabia** and the **United Arab Emirates** have not enacted the broad range of policy measures to advance carbon capture and storage deployment typically seen outside the Arab region. Instead, the two countries have opted for a strategy focused on State ownership of carbon capture and storage facilities, at least in the early deployment stages, rather than creating policy frameworks to encourage private sector investment.<sup>17</sup>



### 3. Arab countries in conflict

Arab countries in conflict<sup>18</sup> face unique challenges in formulating and implementing energy policies. The instability and insecurity caused by conflicts disrupt essential energy infrastructure, supply chains and investment opportunities. This often pushes policymakers to prioritize immediate humanitarian needs over long-term energy planning and development objectives. Addressing these challenges necessitates context-specific strategies that tackle security concerns, prioritize basic energy needs for vulnerable populations, manage reliance on external energy sources and aid, and build capacity for effective energy policy implementation within fragile governance structures.

The war that erupted in Gaza, in **Palestine**, in October 2023, exemplifies how pre-existing energy vulnerabilities become even more acute in conflict zones. Chronic power cuts, affordability issues and fuel shortages plagued Gaza even before the war. These were intensified by reliance on electricity imports from Israel and infrastructure damage from recurring military escalations. Residents turned to generators and renewable energy solutions, such as solar water heaters and photovoltaic systems, to cope with unreliable grid electricity. The war brought devastating blows, however, through limits on the types and quantities of fuel allowed into Gaza through Israeli-controlled crossings, targeted destruction of solar panels and the stoppage of Israeli supply, severely undermining even the most basic services.<sup>19</sup>

Recovery efforts in contexts of war and occupation must tackle the root causes of conflict and consider the water-energy-food-environment nexus for sustainable progress. This involves simultaneously improving energy and water access, ensuring food security, supporting livelihoods, enhancing health and achieving environmental outcomes.





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## D. Policies to leave no one behind

Vulnerable groups face an elevated risk of being left behind and must be considered in the Arab region's and countries' efforts to achieve SDG 7. Yet energy policies, plans and strategies typically overlook these groups and fail to consider gender dynamics. Table 7.1 details obstacles for vulnerable groups as well as examples of policies to address their needs.

**Table 7.1**  
Examples of policies to leave no one behind

Groups at risk of being left behind	Examples of policies to leave no one behind
 <p><b>Inhabitants of rural and remote areas</b> face significant disparities in access to energy services compared to their urban counterparts. They have lower access to electricity as well as clean fuels and technologies for cooking, heating and lighting. Energy poverty limits their opportunities to improve their livelihoods, leave poverty and access quality education, health care and other public services.</p>	<p><b>Algeria</b> has made a sustained effort to electrify remote areas in the south of the country. For example, the Isolated Networks of the South Programme provided additional electrical energy production capacity of 566 megawatts from 2010 to 2018.</p> <p>In <b>Morocco</b>, the Global Rural Electrification Programme has helped achieve nearly universal rural electricity access, with 99.9 per cent of the rural population having access to electricity in 2021 (see section B for more details).</p>
 <p><b>People living in poverty</b> are more likely to lack access to electricity and clean fuels and technologies for cooking, heating and lighting. In addition, they often must devote a significantly higher share of their incomes to access energy compared to wealthier individuals.</p>	<p>In <b>Mauritania</b>, the Government has established a financing mechanism for low-income households and other vulnerable groups (such as female-headed households, informally settled people and displaced persons) regardless of the technology supply (grid, mini-grid or off-grid).</p> <p>In the <b>Sudan</b>, a social or lifeline tariff mechanism supports grid-connected low-volume consumers.</p>
 <p><b>Women and girls</b> face considerable challenges due to energy poverty, which undercuts their well-being and economic prospects. Limited electricity access exacerbates time poverty<sup>a</sup> and places a heavier burden of unpaid care and domestic responsibilities on women. Women are disproportionately vulnerable to premature mortality due to indoor air pollution resulting from the use of unclean cooking fuels. Furthermore, their representation in key public sector roles responsible for energy policies and programmes remains insufficient. Moreover, their participation in the energy sector workforce in the region is less than 15 per cent, significantly below the global average of 22 per cent.<sup>b</sup></p>	<p>In the <b>Sudan</b>, the national plan to scale up access to clean cooking solutions takes the gender-based impact of cooking practices into account. It also includes a targeted awareness-raising strategy to drive adoption, with tailored messages for both men and women, including on health.</p>

<sup>a</sup> Time poverty is broadly understood as the lack of time needed for individuals to meet their basic requirements for rest and leisure, owing to an excess of paid work and unpaid care and domestic work (Vickery, 1977; UN Women, 2020).

<sup>b</sup> World Bank, 2022.



## E. The financing landscape

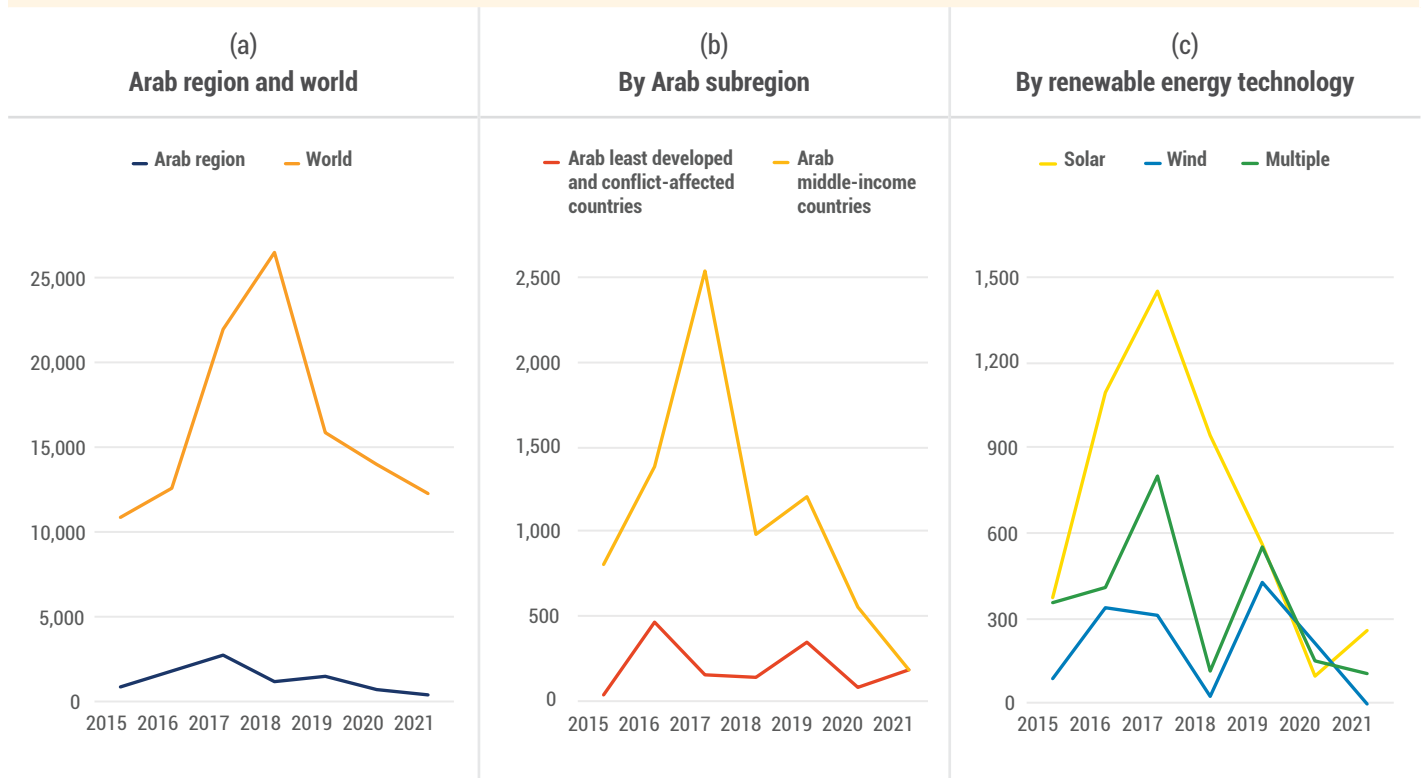
International financial flows to Arab countries for clean energy R&D and renewable energy production, including in hybrid systems, have plummeted. Foreign governments, multilateral agencies and other development finance institutions provided a peak of \$2.7 billion in 2017, but this dropped to \$363 million by 2021 (see panel (a) in figure 7.3), a decline of 87 per cent.<sup>20</sup>

Furthermore, the global share of clean energy funding directed to Arab countries has shrunk significantly. In 2017, these flows accounted for 10 per cent of the global total. By 2021, the share had fallen to just 4 per cent.

There has been a significant change in the subregional distribution of international financial flows in support of clean energy. The share going to middle-income countries fell from 97 per cent in 2015 to 50 per cent in 2021, while the share going to the least developed and conflict-affected countries increased from 3 to 50 per cent in the same period. The increase in the share for the latter was not due to a significant rise in flows to these countries, however, but to the sharp drop in flows to middle-income countries (see panel (b) in figure 7.3). In terms of renewable energy type, solar remained the leading technology in every year from 2015 to 2021, except in 2020, when wind took the leading position (see panel (c) in figure 7.3).

**Figure 7.3**

International financial flows to low- and middle-income countries in support of clean energy R&D and renewable energy production, including in hybrid systems (Millions of dollars)



Source: ESCWA Arab SDG Monitor.



Across the Arab region, a variety of financing mechanisms are driving the uptake of clean energy solutions. Several instruments prioritize de-risking strategies to overcome investment barriers and mitigate perceived risks. Guarantee mechanisms to address political and currency risks are particularly crucial for least developed and fragile countries.

- ◆ **National public funds** dedicated to supporting the energy transition include the Renewable Energy and Energy Efficiency Fund in **Jordan**, the Fund to Support, Renewable Energy and Energy Efficiency in the **Syrian Arab Republic** and the Energy Transition Fund in **Tunisia**.
- ◆ **Credit lines and revolving funds** with banks facilitate energy efficiency initiatives in industrial, residential and municipal sectors in some countries including **Algeria, Jordan, Morocco** and **Tunisia**. One notable example is the Municipal Energy Efficiency Programme in **Jordan**, administered by the Cities and Villages Development Bank. It promotes investment in renewable energy and energy efficiency infrastructure, including rooftop solar photovoltaic systems, street lighting refurbishments and energy efficiency enhancements in public buildings.<sup>21</sup>
- ◆ **Green bonds** to finance clean energy initiatives have been issued in **Morocco, Qatar** and the **United Arab Emirates**, as well as by regional and multilateral financial institutions with projects in

the region. For example, the Islamic Development Bank committed \$110 million from its first sustainable *sukuk* (a *sharia*-compliant sustainable bond) to a photovoltaic solar power plant in the **United Arab Emirates**.<sup>22</sup>

- ◆ **Blended finance** can make projects more attractive to private investors by mitigating risks and providing initial funding. For example, the Northern State Photovoltaic Fund of the **Sudan** leveraged \$4.3 million from the Global Environment Facility and \$2.5 million to \$3 million in government funds to attract a further \$17.9 million in investment from 11 commercial banks. This enabled a subsidy scheme that made solar-powered irrigation accessible to farmers. Building on this success, a National Photovoltaic Fund has been developed, extending benefits to farmers across the country.<sup>23</sup>
- ◆ **Customs and tax incentives and facilities** can be used to promote clean renewable energy projects, as in the **Syrian Arab Republic**, where Investment Law No. 18 of 2021 extended full exemption from financial, customs and non-customs duties and a substantial 50 per cent reduction in income tax for a decade, and stipulated the provision of essential land for project establishment. Incentives and facilities have also been provided to encourage clean energy use, such as for the acquisition of emissions-free electric cars in **Oman** or the use of renewables in heating and cooling systems in **Lebanon, Morocco** and **Tunisia**.

### The Energy Transition Fund fuels energy transition in Tunisia

Established in 2014 to replace the National Energy Conservation Fund, the Energy Transition Fund of **Tunisia** subsidizes clean energy initiatives that are cost-effective for the State but not profitable enough for consumers. The fund leverages tax levies (primarily on car registrations, air conditioners and incandescent lamps) and mobilizes co-investment and lending from banks and investment funds. Between 2005 and 2016, it collected €100 million and deployed €70 million for projects focused on energy substitution (50 per cent), renewable energy (41 per cent) and energy efficiency (9 per cent). The fund's impact is undeniable: it has mobilized €450 million in private investments, saved 2.7 million tons of oil equivalent and avoided 6.3 million tons of carbon dioxide emissions.

The fund operates through a diverse toolkit, offering subsidies, loans and equity investments targeting specific needs. Loan partnerships with banks bridge financing gaps, while equity investments support promising individuals with limited equity. Notably, a consumer-repayment mechanism allows loan repayments through electricity bills, encouraging uptake of solar solutions.

This pioneering model highlights the power of strategic partnerships and targeted interventions in accelerating clean energy transitions. As Tunisia charts its path towards a sustainable future, the Energy Transition Fund can serve as a model for other nations seeking similar transformations.

Source: ESCWA, 2021.

## F. Regional dimensions

- The **Pan-Arab Sustainable Energy Strategy**, approved by the Arab Ministerial Council of Electricity in 2016 as an extension to the Pan-Arab Renewable Energy Strategy 2010–2030, sets a basis for regional cooperation to drive the deployment of renewable energy, the enhancement of energy efficiency, the improvement of energy access and the reduction of energy-related carbon dioxide emissions. It provides specific targets with clear indicators.
- To support the region's sustainable energy ambitions, the Regional Centre for Renewable Energy and Energy Efficiency, the League of Arab States and the International Renewable Energy Agency launched the **Pan-Arab Clean Energy Initiative**, a key component of a roadmap of actions to implement the strategy. The initiative aims to promote the integration of greater shares of renewables in regional power systems, including by improving national energy planning practices so that countries better account for the variability of wind and solar power.
- Given the water-energy-food-environment nexus, renewable energy and energy efficiency are mainstreamed in regional sectoral strategies for climate action and water. In particular, the **Arab Framework Action Plan on Climate Change (2010–2030)** calls for focusing on the use of renewable energy in water desalination and water treatment as a promising solution to close the region's water gap. The **Arab Strategy for Water Security in the Arab Region (2010–2030)** proposes using available alternative clean energy sources, such as wind and solar energy, and developing related

scientific research to use such energy in water desalination and treatment.

- Transboundary energy cooperation is a critical requirement for energy security in some countries. At least 10 countries have included measures in their nationally determined contributions related to regional cooperation in energy, of which eight (**Bahrain, Egypt, Jordan, Lebanon, Libya, Morocco, Qatar and Tunisia**) are for intra-Arab cooperation and two (**Djibouti and Mauritania**) are for cooperation with non-Arab neighbouring countries. For example, in 2011, **Djibouti** finalized an electricity interconnection project with Ethiopia, through which it receives 65 per cent of its electricity consumption. The country seeks to further develop this connection, provided it receives international financial support.
- Enhanced regional electricity grid connectivity also has the potential to enable greater integration of renewables in the region by connecting demand centres with remote sources of low-cost renewable energy while increasing system flexibility.<sup>24</sup>





## Endnotes

1. The 17 Arab countries surveyed by the Energy Sector Management Assistance Programme were Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, the State of Palestine, Qatar, Saudi Arabia, Somalia, the Sudan, Tunisia, the United Arab Emirates and Yemen (ESMAP, 2022). section, "17 countries" refers specifically to these countries.
2. Algeria, Bahrain, Egypt, Jordan, Lebanon, Morocco, Oman, the State of Palestine, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates (ESMAP, 2022).
3. Long-term power purchasing agreements mitigate risks for developers, rendering investments in renewable energy projects more attractive.
4. Algeria, Egypt, Jordan, Lebanon, Morocco, Oman, the State of Palestine, Tunisia and the United Arab Emirates (ESMAP, 2022).
5. ESMAP, 2022.
6. IRENA, 2022.
7. Ibid.
8. ESCWA, 2017.
9. The 16 countries with national energy efficiency action plans or legal frameworks in 2021 were Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, the State of Palestine, Qatar, Saudi Arabia, Somalia, the Sudan, Tunisia, the United Arab Emirates and Yemen. Mauritania did not have a national action plan or legal framework in place. Information was not available for the Comoros, Djibouti, Iraq, Libya and the Syrian Arab Republic (ESMAP, 2022).
10. Algeria, Bahrain, Egypt, Jordan, Oman, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates (ESMAP, 2022).
11. Algeria, Lebanon, the State of Palestine, Qatar and the United Arab Emirates (ESMAP, 2022).
12. United Arab Emirates, Ministry of Energy and Infrastructure, 2023.
13. ESMAP, 2022.
14. Sustainable Energy Fund for Africa and African Development Bank, 2019.
15. [ESCWA Arab SDG Monitor](#).
16. Sudan, 2021.
17. Global CCS Institute, 2018.
18. This country subgroup includes Iraq, Libya, the State of Palestine, Somalia, the Sudan, the Syrian Arab Republic and Yemen.
19. ESCWA, 2023a.
20. [ESCWA Arab SDG Monitor](#).
21. ESCWA, 2021.
22. ESCWA, 2023b.
23. UN DESA, 2023.
24. ESCWA, 2023c.

## References

- Alkousaa, Riham and Friederike Heine (2023). [Consortium signs \\$34 billion MoU for hydrogen project in Mauritania](#). *Reuters*, 8 March.
- Comoros (2018). [Stratégie de croissance accélérée et de développement durable \(SCA2D\) 2018–2021](#).
- Economic and Social Commission for Western Asia (ESCWA) (2017). [Developing the Capacity of ESCWA Member Countries to Address the Water and Energy Nexus for Achieving Sustainable Development Goals: Water-Energy Nexus Operational Toolkit – Renewable Energy Module](#).
- \_\_\_\_\_ (2021). [Toolkit for Energy Efficiency Financing Instruments for Buildings in the Arab Region](#).
- \_\_\_\_\_ (2023a). [War on Gaza: weaponizing access to water, energy and food](#).
- \_\_\_\_\_ (2023b). [Annual SDG Review 2023: The private sector and the SDGs in the Arab region](#).
- \_\_\_\_\_ (2023c). [Review of progress in the Arab region under the Decade for Sustainable Energy](#).
- Egypt, State Information Service (2022). [On COP 27 sidelines, Egypt signs agreements worth \\$83 billion in renewable energy sector](#). 16 November.
- Energy Sector Management Assistance Program (ESMAP) (2022). [Regulatory Indicators for Sustainable Energy \(RISE\)](#). Washington, D.C.: World Bank.
- Global CCS Institute (2018). [2018 Thought Leadership Report: CCS Policy Indicator \(CCS-PI\)](#).
- Hamdy, Habiba (2022). [Egypt signs 7 MoUs with regional, int'l partners to produce green hydrogen](#). *Ahram Online*, 7 December.
- International Energy Agency (IEA) (2023). [Renewable Hydrogen from Oman: A Producer Economy in Transition](#).
- International Renewable Energy Agency (IRENA) (2022). [Renewable Energy Targets in 2022: A Guide to Design](#). Abu Dhabi.
- McKinsey (2023). [Using digital and AI to meet the energy sector's net-zero challenge](#). *Quantum Black*, 18 July.
- Morsy, Ahmed (2022). [Green hydrogen bonanza](#). *Ahram Online*, 22 August.
- Oman (2022). [The Sultanate of Oman's National Strategy for an Orderly Transition to Net Zero](#).
- Sudan (2021). [First Nationally Determined Contribution Under the Paris Agreement: Updated](#).
- Sustainable Energy Fund for Africa and African Development Bank (2019). [Mini-Grid Market Opportunity Assessment: Mauritania](#).
- United Arab Emirates, Ministry of Energy and Infrastructure (2023). [National Hydrogen Strategy](#). Abu Dhabi.
- United Nations Conference on Trade and Development (UNCTAD) (2023). [State of Commodity Dependence 2023](#). Geneva.
- United Nations Department of Economic and Social Affairs (UN DESA) (2023). [Promoting the Use of Electric Water Pumps for Irrigation in Sudan](#). Accessed on 16 February 2023.
- United Nations Entity for Gender Equality and the Empowerment of Women (UN Women) (2020). [World Survey on the Role of Women in Development 2019: Why Addressing Women's Income and Time Poverty Matters for Sustainable Development](#). New York.
- Vickery, Clair (1977). [The Time-Poor: A New Look at Poverty](#). *Journal of Human Resources*, vol. 12, No. 1, pp. 27–48.
- World Bank (2022). [Toward More and Better Jobs for Women in Energy: An Assessment Undertaken to Guide the New Regional Network in Energy for Women in the Middle East and North Africa–RENEW](#). Washington, D.C.