

COAL EXPANSION PLANS IN THE MIDDLE EAST AND AFRICA

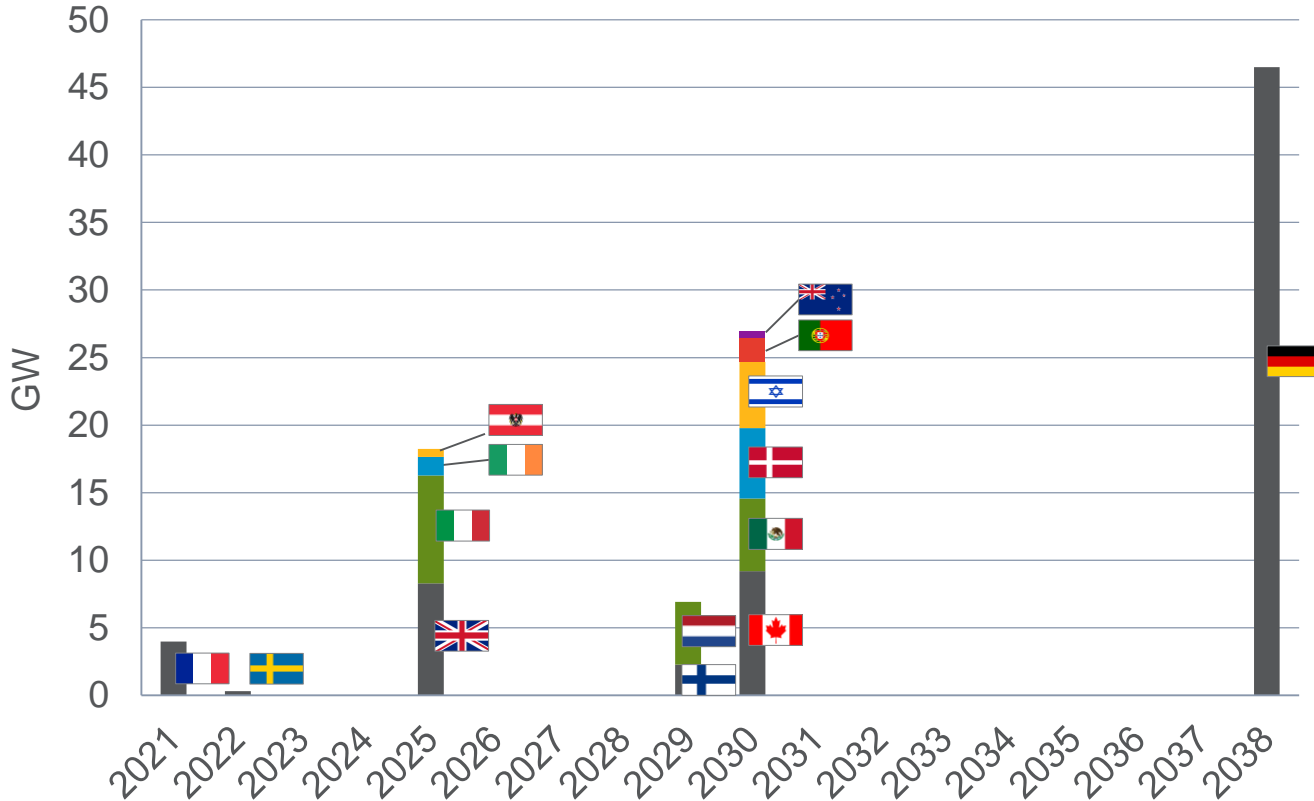
ANA AMAZO, HENRIK SCHULT

AUGUST 2, 2019

NAVIGANT

COAL PHASE-OUT PLANS ANNOUNCED, BUT MARGINAL COMPARED TO TOTAL CAPACITIES

Announced coal phase-out year and total coal capacity to be decommissioned



Global gross operating coal capacity: 2,015 GW*



Planned coal phase-out 5% (105 GW)

No coal phase-out planned 95% (1,910 GW)

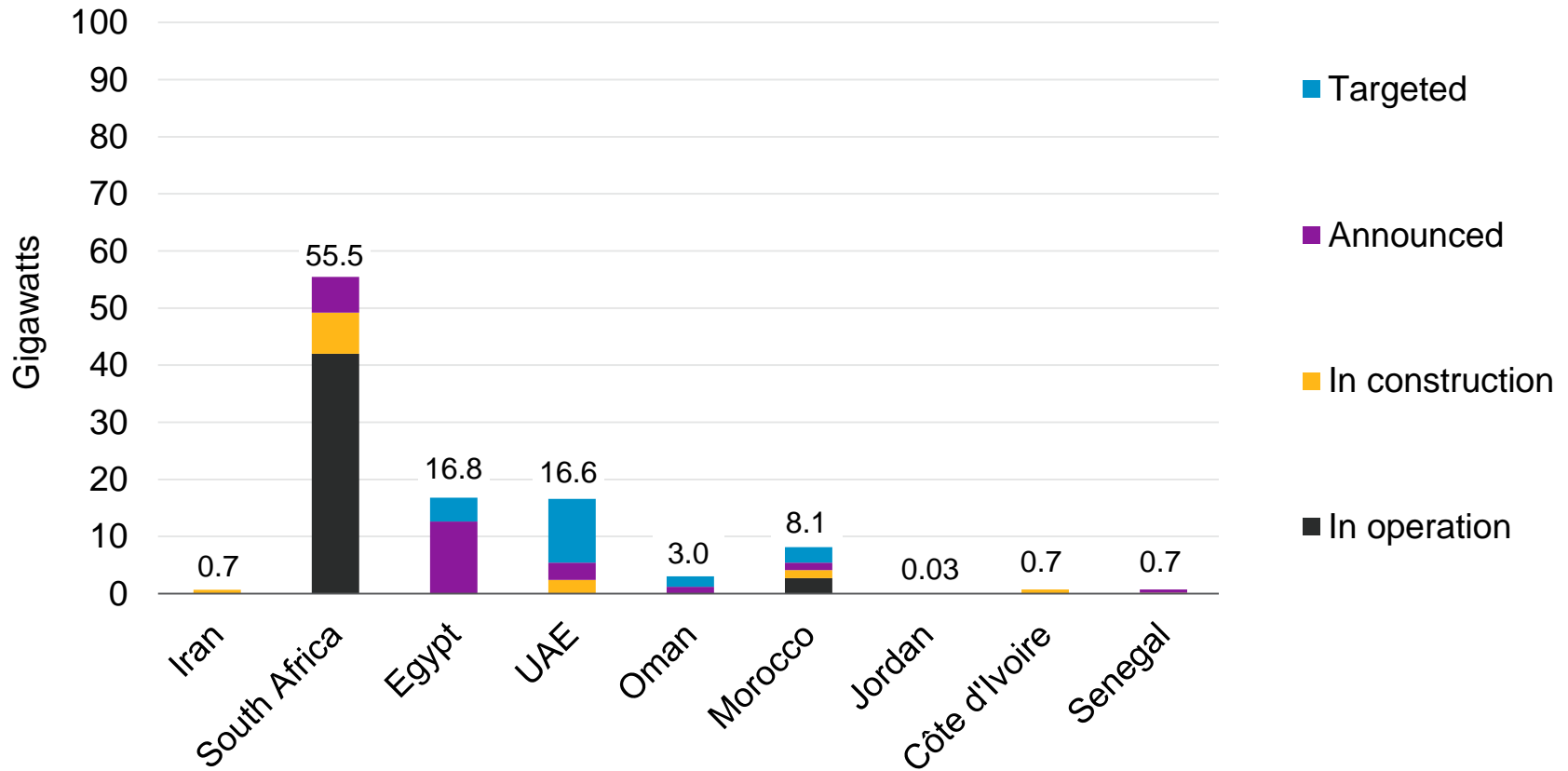
*Status: January 2019, includes units above 30 MW

Countries with phase-out plans but no coal-fired units above 30 MW are not indicated, those include: Angola, Belgium, Costa Rica, El Salvador, Ethiopia, Fiji, Latvia, Liechtenstein, Lithuania, Luxembourg, Marshall Islands, Niue, Switzerland, Tuvalu, Vanuatu

Carbonbrief 2019, Government of Canada 2019, Powering Past Coal Alliance 2018, Europe Beyond Coal 2018

AT THE SAME TIME: NEW COAL-FIRED CAPACITIES IN THE MIDDLE EAST AND AFRICA HAVE BEEN ANNOUNCED

Coal generation capacities in selected countries in Middle East & Africa



EIA 2018, Republic of South Africa 2018, Sourcewatch 2018, Sasol 2018, Senelec 2018, Carbon Brief 2017, Apicorp Energy Research 2017

THE EXPANSION OF COAL-FIRED POWER GENERATION IS INCOMPATIBLE WITH GLOBAL CLIMATE PROTECTION EFFORTS

Bloomberg

Climate Changed

Scientists Weigh Call for Much Deeper Cuts to Coal Pollution

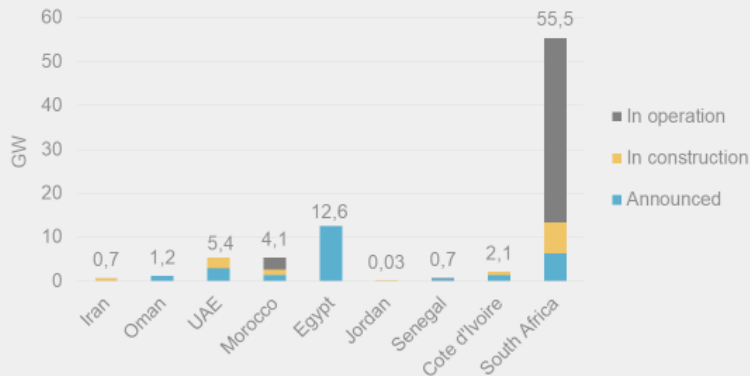
Panel convened by the United Nations is assessing a stricter limit on emissions that cause global warming

By [Jeremy Hodges](#)

September 30, 2018, 5:00 PM GMT+2 Updated on October 1, 2018, 8:08 AM GMT+2

... YET THERE HAVE BEEN INCREASING ANNOUNCEMENTS FOR NEW COAL-FIRED CAPACITIES IN THE MIDDLE EAST AND AFRICA

Coal generation capacities in selected countries in Middle East & Africa



EIA 2018, Republic of South Africa 2018, Sourcewatch 2018, Sasol 2018, Semtec 2018, Carbon Brief 2017, Apicorp Energy Research 2017

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What are the motivations to introduce/add coal-fired power generation?

Study for GIZ “DIAPOL-CE Policy dialogue and knowledge management on low emissions development strategies in the MENA region“

Commissioned by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

(forthcoming)

STUDY ON BEHALF OF GIZ: ROLE OF COAL IN THE MENA REGION AND ALTERNATIVE PATHWAYS

Aim of study

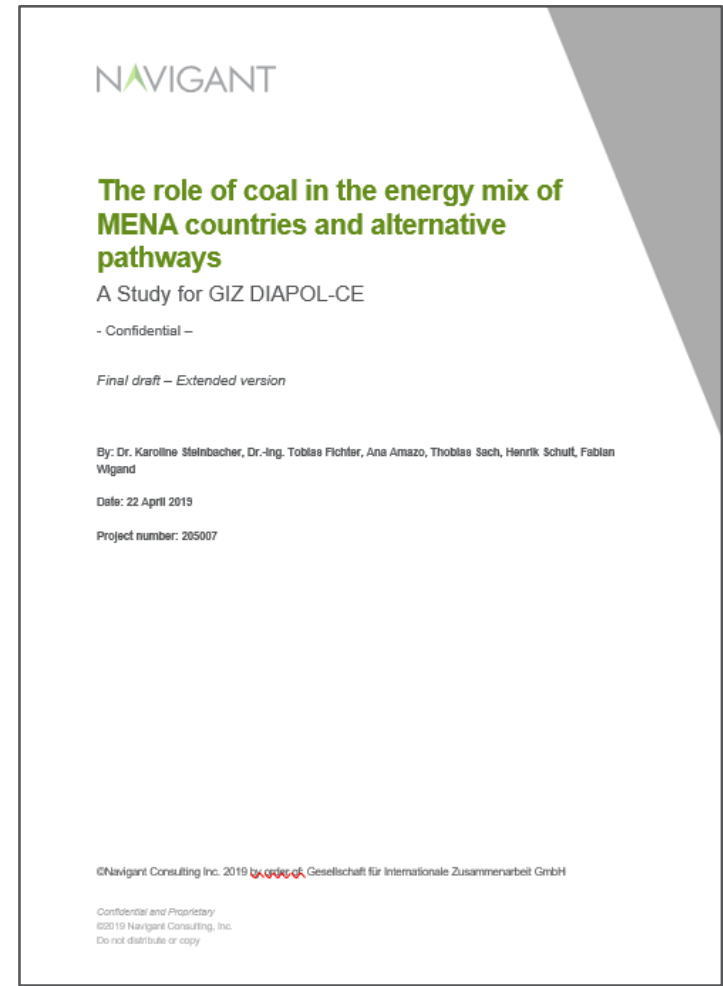
- Policy recommendations and narrative in favor of alternative pathways
- Provide factual basis on planned and existing coal-fired capacity in the MENA region
- Model various long-term capacity expansion scenarios

GIZ project coordination




- Anita Richter

Navigant project team




- Dr. Karoline Steinbacher
- Dr.-Ing. Tobias Fichter
- Ana Amazo
- Thobias Sach
- Henrik Schult
- Fabian Wigand



COAL HAS PLAYED A MINOR ROLE IN THE REGION; ENERGY SECURITY CONCERNS AND RISING DEMAND HAVE BROUGHT IT TO THE AGENDA (III/III)

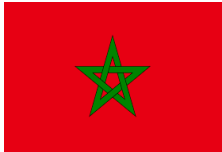


	Current role of coal	Motivations	Outlook
Senegal 	<ul style="list-style-type: none"> Minor role: 141 MW in operation 	<ul style="list-style-type: none"> Dependency from fuel imports Diversification of energy mix Security of supply 	<ul style="list-style-type: none"> Two 300-MW coal projects likely to be shelved Government plan: 850 MW by 2035
Ivory Coast 	<ul style="list-style-type: none"> No coal in electricity generation so far No domestic coal production 	<ul style="list-style-type: none"> Shortages in gas supply Diversification Extension of capacity to become energy hub Growing demand 	<ul style="list-style-type: none"> San Pedro plant (1.4 GW) announced, later reduced (0.7 GW). Under construction
South Africa 	<ul style="list-style-type: none"> Power mix share of 85% Fifth-largest coal exporter 	<ul style="list-style-type: none"> 10th largest coal reserves worldwide Cost competitiveness Contributor to economy and employment 	<ul style="list-style-type: none"> Decommissioning of 12 GW of coal capacity by 2030 (41% in total power) and 35 GW by 2050 (11% in total power)

COAL HAS PLAYED A MINOR ROLE IN THE REGION; ENERGY SECURITY CONCERNS AND RISING DEMAND HAVE BROUGHT IT TO THE AGENDA (I/III)

	Current role of coal	Motivations	Outlook
Iran 	<ul style="list-style-type: none"> • Minor role (only small industrial site) 	<ul style="list-style-type: none"> • Opportunity cost of gas (vs. exports) • Local value creation through coal • Complications with RES due to sanctions 	<ul style="list-style-type: none"> • Tabas power plant “under construction” for ~10 years. Might be abandoned.
Oman 	<ul style="list-style-type: none"> • Earlier coal plants halted • Share of coal in long-term mix discussed 	<ul style="list-style-type: none"> • Industrial development (diverting gas to industry) • Opportunity cost of gas (vs. exports) • Security of supply 	<ul style="list-style-type: none"> • 1.2 GW Duqm plant still discussed • RES and improved interconnections could delay coal expansion
UAE 	<ul style="list-style-type: none"> • No coal in power mix so far • Target: 12% of capacity by 2050 	<ul style="list-style-type: none"> • Decreasing available gas resources • Diversification • Very high standards for security of supply 	<ul style="list-style-type: none"> • Hassyan 2.4 GW under construction. Additional 1.2 GW possible. • Improved trade, RES and overcapacity could delay coal expansion

Personal communication with local stakeholders between June and September 2018

COAL HAS PLAYED A MINOR ROLE IN THE REGION; ENERGY SECURITY CONCERNS AND RISING DEMAND HAVE BROUGHT IT TO THE AGENDA (II/III)

	Current role of coal	Motivations	Outlook
Morocco 	<ul style="list-style-type: none"> • Power mix share of > 50% • 1.4 GW online since late 2018 	<ul style="list-style-type: none"> • Growing demand • Cost competitiveness • Insufficient domestic fossil fuel supply 	<ul style="list-style-type: none"> • 1.32 GW planned (Nador) currently on hold due to opposition & port logistics
Egypt 	<ul style="list-style-type: none"> • Target: 16.8 GW coal by 2030 • Hamarawein project of 6 GW awarded at \$5.4ct/kWh 	<ul style="list-style-type: none"> • Secure supply to industry • Growing demand • Industrial development (diverting gas to petrochemicals, fertilizers) 	<ul style="list-style-type: none"> • Financial guarantees for 6 GW Hamarawein announced • PPA for 2.6 GW Ouyan Moussa plant announced (\$4ct/kWh)
Jordan 	<ul style="list-style-type: none"> • Minor role: 30 MW Qatraneh plant operational • Target: 5% coal goal by 2025 	<ul style="list-style-type: none"> • Lack of indigenous fossil fuel resources • Secure supply to industry • Population increase 	<ul style="list-style-type: none"> • No concrete additional coal plans announced

Personal communication with local stakeholders between June and September 2018

HOW TO CONVINCING POLICY MAKERS TO HALT COAL EXPANSION? (I/III)

Develop long-term energy strategies that mitigate investor risk



Global trend toward decarbonization is well underway and poses a substantial risk of stranded investments for investors in coal-fired power generation



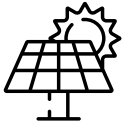
Introduction of CO₂-prices in different forms can lead to a lower utilization of coal-fired generation



Public opposition against coal projects is becoming an increasing investor risk

HOW TO CONVINCING POLICY MAKERS TO HALT COAL EXPANSION? (III/III)

Take advantage of declining costs for renewables and consider externalities of coal-fired generation



MENA region and Middle East is uniquely positioned to benefit from already low and declining costs of RES



Externalities such as pollution, public health threats and import dependence should be considered



Cost of energy systems can be reduced without coal even further, e.g. by tapping into preferential funding available from multilateral banks

HOW TO CONVINCING POLICY MAKERS TO HALT COAL EXPANSION? (II/III)

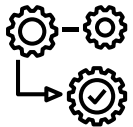
Build flexible power systems that can accommodate renewables most efficiently



Growing energy demand in the investigated countries requires investments in electricity systems



Investments should be made in the perspective of enhancing flexibility to accommodate variable renewables in a cost-efficient manner



Flexible power systems will increase reliability of supply and make energy systems proof for future challenges

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