



**Analytical article**

# Will the Russia-Ukraine War Accelerate Egypt-Europe Electricity Interconnection Plans?

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The Ukraine crisis has had a significant bearing on the global scene, particularly oil and natural gas supplies and energy security. The war, now reaching the 150-day mark, has brought about a radical change in the European Union's energy plans, with several European countries moving at an accelerating pace to break away from Russian gas dependency.

is enduring and Europe's move to end dependency on Russian fossil fuels.

One key advantage of the interconnection of power grids is reducing the spare capacity in power grids, which would in turn reduce the capital investment needed to meet the demand for capacity, without compromising safety and power systems reliability. Additionally, interconnection of power systems enables building generating plants in economically-feasible areas, with the availability of cheap fuel and capacity surplus that is hard to export or store in one of the interconnected countries.

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Being aware of the economic and financial advantages of grid interconnection, several Arab countries have interconnected their power systems since the early 1950s. Overall, international interconnections (between two or more countries) bring several benefits to the involved countries, including primarily:

- Providing electricity-generating capacity.
- Enabling power exchange between countries and exchanging electric power in case of emergency, ensuring sustainability of the reserve capacity.

Over the past years, Egypt has achieved several successes in the energy sector, capitalizing on its strategic location, assets and infrastructure, and the strategy set by the Government to advance the energy sector. In essence, Egypt sought developing and exploiting its natural resources, towards shifting from a country struggling to save energy import expenses to an energy exporter and maybe a major player in the global energy market. In effect, Egypt's natural resources enabled it to go ahead with its vision to become a regional energy hub. Beyond this, Egypt has taken serious steps to utilize the spare capacity of the power grid and is seeking to complete

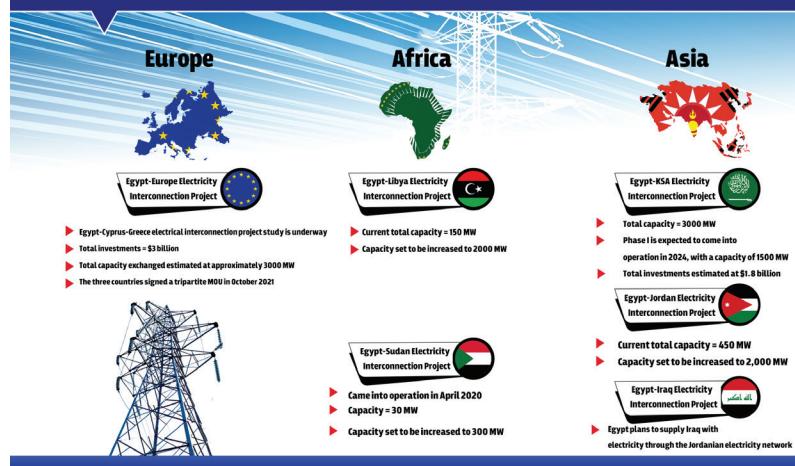
the electricity interconnection with neighboring countries, with the surplus capacity of its power networking amounting to about 20,000 megawatts.

## Egypt's Purpose from Power Interconnections

Moving East, West, North, and South: This is what Egypt plans to achieve by implementing power interconnection projects, setting its sights on becoming a sustainable and secure

source of energy for the world, making capital out of the daily surplus electricity generated by the national grid. Over the coming period, Egypt is projected to complete interconnection projects with neighboring Asian, European, and African countries with a total capacity of about 9,000 megawatts. The main objective? Turning Egypt into a global energy hub, through interconnecting with Africa, Europe and the Gulf countries, let alone the economic gains these projects will bring to Egypt.

### Egypt as a Gateway to Electricity Interconnection between Three Continents



## Accelerated European Endeavors to Secure Energy Supplies

The Russo-Ukrainian gave rise to major crises that disrupted the global energy markets, as has been reflected in the price hikes of petroleum products

and derivatives. The price of a barrel of oil rose to about \$130, recording an increase of more than 20 percent, before it ultimately stabilized at \$100. Likewise, natural gas prices have risen by more than 50 percent. As such, it becomes for the European Union (EU) to seek new energy sources that replace Russian oil and gas.

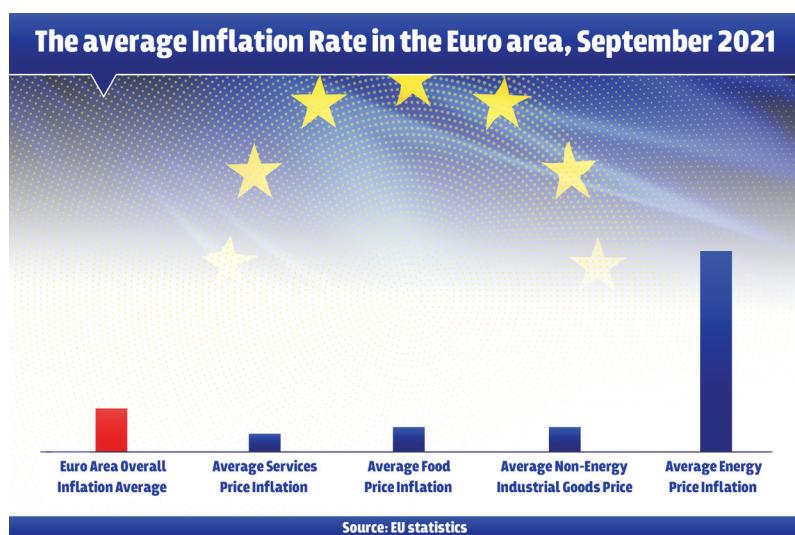
Following Russia's invasion of Ukraine, Europe made clear its intention to abandon Russian oil and natural gas. Late May, the EU announced it would reduce its imports of Russian oil by about 90 percent by the end of 2022, with plans to end its dependency on Russian gas through this decade. In effect, 40 percent of the EU's natural gas imports come from

Moscow, which prompted the EU to look for safe energy alternatives and new suppliers in the eastern Mediterranean, Africa, and the Middle East.

Overall, the Russo-Ukrainian war was not the first crisis to hit the European energy market. There was the inflation of energy prices that hit a high of 17 percent, which caused the average inflation in Europe to increase by about 14 percent. In October 2021, natural gas was traded at €80 per megawatt-hour, i.e. an increase of 250 percent since the beginning of 2021.

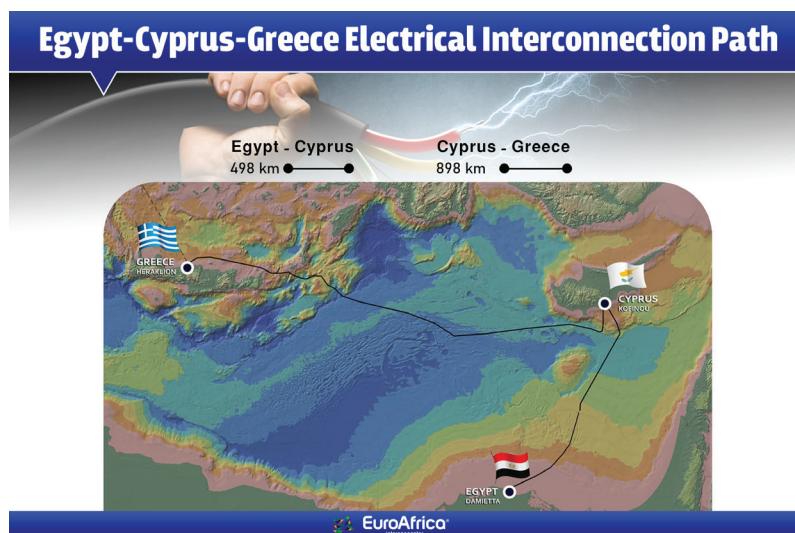
## EuroAfrica Interconnector

The EuroAfrica Interconnector is a submarine power cable with a capacity of about 2000 MW, interconnecting the power grids of Egypt, Cyprus, and Greece with Europe. The project is described as being



an "electricity highway". It involves linking the national grids of Egypt, Cyprus, and Greece through a subsea

DC cable and with HVDC onshore converter stations at each connection point, with a total capacity of 2000MW.



The cable, which is 1,396km long (considered the longest in the world, equivalent to the distance between Berlin and Torquay), will link Africa with Europe and provide an alternative and reliable source for the transmission of electricity to Europe. The project will be implemented in two phases

and is expected to transmit 1,000 megawatts of electricity after the completion of the first phase (from Egypt to Cyprus). With the completion of the second phase, the capacity of the project will reach about 2,000 megawatts (i.e. the total capacity of the line, enough to power up to 2 million households, or power

Berlin and Madrid together in case of maximum load). The expected cost of the project amounts to about €2 billion to be borne by the EU, for the construction of the sub-sea line and the related facilities. The first phase is expected to come into operation in December 2022, while the second phase is expected to be completed by December 2023.

## The Economic and Technical Considerations for International Grid Interconnections

The economic and technical considerations are critical for implementation of the interconnection project. The longer the geographical time difference and the temporal distance between peak hours demand in the interconnected countries, the ideal the interconnection. Notably, technical considerations are no less important than the economic ones. In effect, the cost of overcoming technical difficulties will have a bearing on the long-term nature of the economic return.

Technical difficulties may be generally complex and overcoming them may involve a wide range of technical sides, including primarily the frequency difference of power grids in the interconnected countries (e.g. one grid may be operating at a frequency of 50 Hz and the other operating at a frequency of 60 Hz). Besides the economic return, the strategic considerations of the interconnected countries and the national gains are among other factors that determine the feasibility of interconnection.

## The Strategic Significance of the EuroAfrica Interconnector

The EuroAfrica Interconnector comes within the framework of Egypt's vision to become a regional energy hub. The project will support Egypt's strategic vision to achieve economic development, through interconnecting the power grids of Egypt and

Europe, enabling export of surplus electricity. Further, the project will contribute to promoting cooperation between Egypt, Cyprus, and Greece in the field of electrical interconnection, underscoring Egypt's role as a regional energy hub in the Eastern Mediterranean, given its enormous energy potential and the great strides it has made in the field of electric power generation, allowing it not only to cover domestic consumption but also to export electricity to several countries. In practice, Egypt plays an important role in linking the power grids of the Levant, the Maghreb, and North Africa, and is currently working to complete the joint electrical interconnection project with Saudi Arabia. At large, EuroAfrica Interconnector aligns with the EU's energy policy and contributes to achieving the following energy goals:

- Promoting regional cooperation and

establishing a solid interconnection network in the Eastern Mediterranean, towards improving the security and reliability of energy supply, exchanging electric power in cases of emergency, breakdowns, and interruptions, upgrading the security of electrical supplies, and allowing for electrical interconnection between Egypt and all European countries, which would lead Egypt to become a major electricity hub for the world.

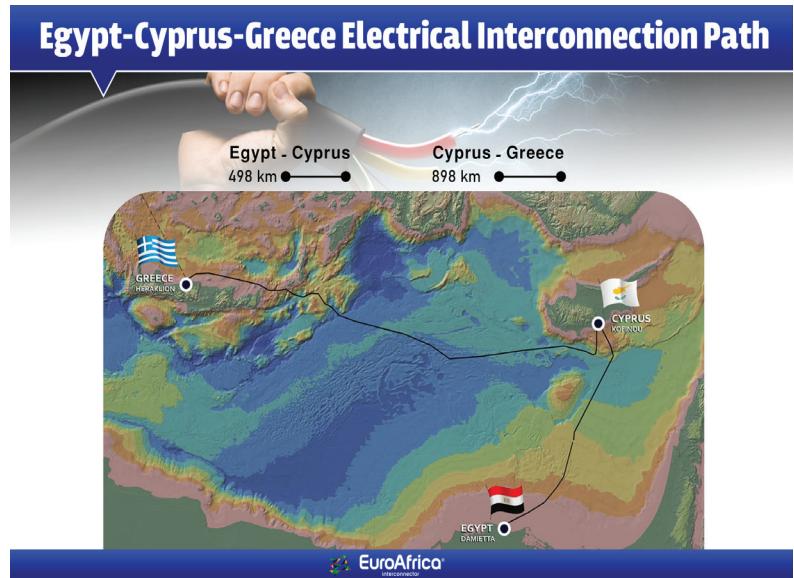
- Fulfilling Egypt's ambitions to become a regional energy hub and a source of green energy to Europe.
- Contributing to the fulfillment of the EU's electricity interconnection target of 10 percent.
- Bringing substantial economic and geopolitical benefits to the interconnected countries.
- Ensuring the security of the EU power grid

and the energy supply between the three interconnected countries, by unifying Cyprus' isolated power systems with the grids of Egypt and Europe, with the continuous possibility of multi-directional power flow.

- Reducing carbon dioxide emissions, which contributes to developing renewable energy sources.
- Creating an important energy hub that will give rise to a well-interconnected network across the eastern Mediterranean and promote the integration of clean energy into the

EU energy mix.

- Constructing an electricity highway between Egypt, Cyprus, and Greece, through which the EU can safely get access to electricity, which will be generated from natural gas reserves in Egypt and Cyprus.
- Ending Cyprus' energy isolation, being the EU member that is still completely isolated from Europe, whether with regard to electric power or natural gas interconnections. Notably, ending energy isolation in Europe stands as a key goal of the EU.



**Egypt's interconnection projects have been paid tribute by international organizations, such as:**

▪ **Bloomberg** commended Egypt's implementation of several electrical interconnection projects, which allow it to establish an energy sharing system with its neighbors, including primarily projects interconnecting Egypt's power grid with grids of Saudi Arabia, Cyprus, and Greece (to be extended to include other European countries).

▪ **Oxford Business Group:** Egypt continues to strive not just for energy independence but to return to its status as a regional exporter, with several interconnection agreements already concluded with Saudi Arabia, Sudan, Cyprus, and Greece.

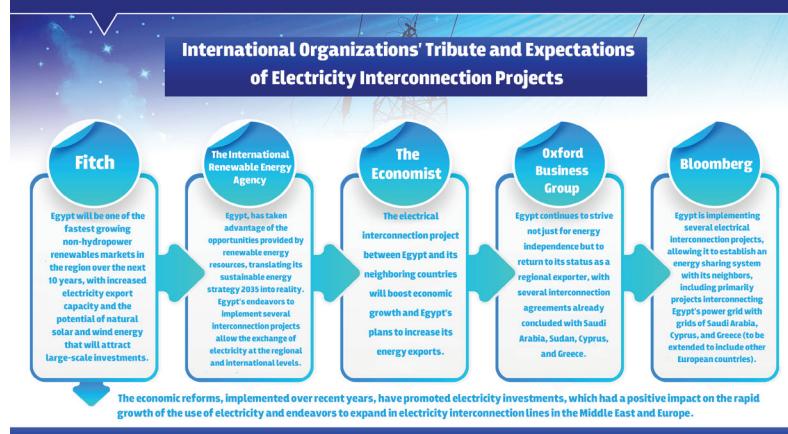
▪ **The Economist:** The electrical interconnection project between Egypt and its neighboring countries will boost economic growth and Egypt's plans to increase its energy exports.

▪ **The International Renewable Energy Agency:** Egypt, has taken advantage of the opportunities provided by renewable energy resources, translating its sustainable energy strategy 2035 into reality. It also commended Egypt's endeavors to implement several interconnection projects to allow the exchange of

electricity at the regional and international levels.

▪ **Fitch:** Egypt will be one of the fastest growing non-hydropower renewables markets in the region over the next 10 years, with increased electricity export capacity and the potential of natural solar and wind energy that will attract large-scale investments.

#### The New Republic as a Hub for Inter-Continental Electricity Interconnection



**In short,** Europe relies on electricity interconnection projects to accelerate the pace of its plans to step away from Russian energy. The Egypt-Cyprus-Greece interconnection project is a key pillar in the current strategic cooperation between Egypt and Europe. It will expedite developing the electricity highway, by increasing electricity supplies while provoking a response to climate change challenges.

In a vital step, Egypt introduced itself as a regional energy hub, aiming at exporting energy to European countries, thus supporting its political and economic relevance to the EU.