



IENE Colloquium 2019

The Geopolitics of Energy Transition

Electrical and natural gas interconnections and energy markets

It is my pleasure and honor to be here today and participate in such an important Colloquium organized by IENE about the Geopolitics of Energy Transition.

IPTO has a very important role to play in the upgrade of Greece's geopolitical position, through the electrical interconnections it is implementing, given that the EU aim for ensuring the security of its energy supply in the long-term is related to the aim of reduced dependence from external resources. The development of Greece's international interconnections plays a crucial role in this respect. The strategic position of the country in the 'crossroads' of the energy networks of Asia, Europe and Africa, the plans for new interconnections in the wider area and the creation of corridors that connect the electricity production centers to the important consumption centers of the Continent is of paramount importance.

Please allow me to elaborate a bit on the significance of international interconnections in general, and then I will briefly analyze the major projects of IPTO that are in progress at the moment.

- International Interconnections drastically contribute to security of supply, especially during energy crises, allowing for imports of electricity when the capacity of a country is at risk.
- They are a key factor for the completion of the European Energy Union through the market coupling of the national electricity markets (I will explain that in more detail later)
- They facilitate the desired high RES penetration in Europe
- They enhance competition in national electricity markets by mitigating differences and price volatility
- They are truly European projects that enhance regional cooperation among EU member countries

The Greek Electricity Transmission System is interconnected to the European electricity grid via Overhead Extra High Voltage Transmission Lines with the Systems of Albania, Bulgaria, Turkey and North Macedonia. It is also connected to the Italian System through a submarine interconnection between the EHV Center of Arachthos in Western Peloponnese and Galatina S/S in Italy.

As we speak, the main project in progress –when it comes to international interconnections - is the construction of a second EHV Transmission Line between Greece and Bulgaria (the so-called Nea Santa-Maritsa TL), which will complement the existing interconnection of the two countries, with the 400 kV Transmission Line connecting the EHV of Thessaloniki with Blagoevgrad in Bulgaria. I am referring to the creation of a second “bridge” between the Transmission Systems of the two neighboring countries, which will increase the capacity for electricity transfer in the North-South axis, reducing congestions. Furthermore, the strengthening of the 400 kV System in the eastern borders of Greece and Bulgaria facilitates the secure penetration for RES in the region.

The second Greece-Bulgaria interconnection is a Project of Common Interest of the EU and is expected to be operational in early 2023. The Energy Regulators of Greece and Bulgaria have recently issued a decision on the cross-border cost allocation. Technical studies and environmental permits have been completed and the related actions have been co-funded by the EU Connecting Europe Facility.

In light of the big improvement of the bilateral relations between Greece and North Macedonia following the Prespes Agreement, there is also an increased focus on closer energy cooperation between the two countries, a field which also includes the electricity interconnections. At the moment, the electricity Transmission Systems of Greece and North Macedonia are connected via two EHV Transmission lines, one between Thessaloniki and Dubrovo and the other between Meliti and Bitola.

IPTO and its North Macedonian counterpart MEPSO have confirmed their desire to strengthen their cooperation in fields of common interest. A year ago, the two TSOs formed a Joint Working Group which is actively exploring the possibilities for enhancing the interconnections between the two countries, increasing the net transfer capacity in both directions. The two Operators commit to undertake the necessary steps for the increase of NTC, based on the results of the studies. Something that can be achieved through either the

construction of a new single-circuit EHV TL between Thessaloniki and Dubrovo, or the upgrade of the existing line to double circuit.

Regarding the Interconnection with Italy, we are currently assessing the operational status in order to explore a possible future upgrade to further secure our interconnection to the West.

Apart from the international interconnections, the “national” ones and especially the island interconnections are also very important for the energy transition, as they are one of the main means for the decarbonization of electricity production and the increased penetration of RES in the energy mix, which constitute – as you all know – fundamental pillars of the Long-Term Energy Planning, both at national and at EU level.

The most emblematic of those projects is without doubt the Crete - Attica interconnection, the cornerstone of the ambitious investment program of IPTO, worth more than 3,5 billion for the next decade.

I have the honor to be the General Manager of “Ariadne Interconnection S.P.L.C”, the subsidiary company of ADMIE S.A., founded in September 2018 which is the project implementation vehicle of the Attica-Crete interconnection.

This project is also emblematic for the benefits that will result from the realization of the island interconnections:

- Security of electricity supply to the islands is ensured over the coming decades
- Their environmental footprint is improved, by phasing out the operation of the polluting, oil-fired electricity production units
- The heavy burden of PSO charges (hundreds of millions of euros every year) is being reduced
- The islands’ rich wind potential is utilized and greater RES penetration is facilitated in the energy mix, which is the central goal of the National Energy Planning

IPTO is committed to completing this extremely critical interconnection in 2022, earlier than initially planned, something that reflects the steady acceleration of all projects in its investment plan.

The first major project that was rapidly completed was Phase A of the Cyclades Interconnection. Eleven islands of the Cyclades, including Syros, Paros and Mykonos have been enjoying since early 2018 cheaper, more reliable and more environmentally friendly electricity, with all the beneficial consequences that this entails for tourism and economic activity.

We continue with Phase B of Cyclades Interconnection that will integrate Naxos into the Interconnected Islands and will strengthen the existing interconnections of Andros and Tinos. Works have already begun and are expected to finish by the end of this year.

The same goes for the so-called “Corridor A” of the Extension of the 400 kV System to the Peloponnese, which will not only enable the development of more RES in the region, but also allow the Megalopoli V unit to operate at higher capacity. At the same time we have already accelerated the initiation of the “Corridor B” of the extension of the 400 kV System Megalopoli-Korinthos with a new Overhead Line and a new EHV Substation in Korinthos.

2020 is the projected year of commissioning of Phase C of the Cyclades Interconnection –which envisages the laying of a second submarine high voltage power line between Syros and Lavrio and the complete ‘decoupling’ of most Cycladic islands from the Local Thermal Production Stations. And last, but most certainly not least, the interconnection between Crete and Peloponnese which will be completed in mid-2020 and will constitute a first major step towards the ending of the electrical isolation of Crete. We call it “small” interconnection, because it looks small – in terms of the main technical characteristics – compared to the “big” Crete-Attica Interconnection. But in fact we are talking about the longest AC submarine and underground interconnection in the world, which symbolizes the entry of IPTO in the new era of cutting-edge technology, interconnectivity and clean energy sources.

Having mentioned the important investments in interconnections I would like to move on to the important objective of European electricity markets integration through the adaptation of the Greek electricity market model to the so called “European target model”.

Energy market liberalization and creation of a single competitive electricity markets has been one of the core objectives of the European Union ever since the energy sector reforms back in 1990. The creation of a liberalized electricity market is an important step towards integration of the internal electricity market, increase in electricity production, transmission and distribution efficiency, strengthening of security of supply and reinforcement of

competition of the European economy, by preserving at the same time the natural environment.

Directive 96/92/EC of the European Parliament was the first regulatory framework, also known as the first energy package, which set common rules for the internal electricity markets and introduced the electricity market liberalization of member states which was the prerequisite for integration of the internal market. The second energy package under Directive 2003/54/EC triggered further reforms in the energy sector, while the third energy package under Directive 2009/72/EC set clear rules for the internal market in electricity. This Directive was adopted to Greek Law with Law 4001/2011, the same Law which also allocated to IPTO the role of the Transmission System Operator under the ITO model.

To enable market integration, the Agency for the Cooperation of Energy Regulators (ACER) has proposed a common pan-European market model, known also simply as Target Model. This model enables optimal utilization of the transmission system capacity, focusing on the role of interconnections, through harmonized TSO practices. It also aims on achieving reliable market prices and sufficient liquidity on capacity allocation of interconnection in day ahead markets, while enabling efficient operation of forward markets and intra-day markets for capacity allocation in interconnections.

This pan-European model is based on Framework Guidelines published by ACER and in Network Codes published by the European Network of Transmission System Operators for electricity (ENTSO-E) and approved by the European Commission, in order to create harmonized rules for cross-border energy trading and functioning of wholesale electricity markets.

The five core elements of the Target model are: capacity calculation, capacity allocation, day-ahead price coupling, continuous intraday trading and efficient operation of balancing markets.

Common capacity calculation is necessary in order for the TSOs to be able to allocate maximum available capacity of interconnectors to the market, without risking security of supply of the electricity system. Cross-border capacity must be available to all market participants for allocation of forward contracts, through transparent allocation rules. The EU has given increased importance in cross-border capacity management because it provides an increase in both market competition and in security of supply. More market players participating in the energy market results in increased competition, thus lower

prices, while interconnectors act as an additional electricity source, strengthening the security of the system.

Day-ahead price coupling is achieved through implicit auctions on interconnections, which ensure that all available transfer capacity will result in optimal power flows between countries, meaning flows from markets with lower price to market with higher price, a process known also as market coupling. Provided there are no capacity constraints between countries or bidding zones, the market price of all European zones will be the same of location or source of energy produced. Therefore, the total efficiency of the European market is maximized, while pan-European competition ensures that in the long term all European citizens profit from the converging market prices.

Intraday markets are essential for optimal allocation of any further available transfer capacity occurring between the day-ahead market stage and the real time operation of the market. In this way, prices in both intraday markets and day-ahead market are ensured to reflect interconnections congestion, identifying in the long term areas for optimal investments.

Finally, balancing markets are necessary for the efficient system operation and the fair remuneration of all systems reserves that TSOs need to procure ahead of real time. Furthermore, balancing markets provide fair allocation of system imbalances cost, by incentivizing the decrease of imbalances by market participants, resulting in increased security and overall market efficiency.

This model has been applied in most European countries in the past years and it has shown significant increase in wholesale electricity market price convergence in all regions, resulting in increase of social welfare. It is important to note that currently, the fourth EU energy package is being prepared, the so called Clean Energy Package. Clean Energy Package focuses in strengthening competition in wholesale markets through further production sources diversification, by promoting CO₂ emissions reduction, by enhancement of RES and enablement of demand response in all market stages. The fourth package promotes even further optimal interconnections usage and regional coordination by strengthening the role of RCSs.

Speaking of regional market developments, the South Eastern Europe region is one of the last European regions in which the European market model is going to be applied. The SEE region consists of mostly small markets, which however have big potential due to the fact that electricity consumption is constantly increasing as electrification increases. Greece is currently the

biggest electricity market in the Balkan region, with over 50 TWh yearly demand and interconnections both with Italy, with which initial market coupling with the European countries will be achieved and with the north borders, among which market coupling will be performed with Bulgaria. Once both Italian and Bulgarian electricity markets are coupled with the Greek market, then the entire region will benefit from participating in the common pan-European internal market, triggering the path towards market integration for all countries in the region, provided all regulatory steps towards unbundling have taken place.

Application of the EU Target model in Greece will:

- Increase competition and reduce the potential for market concentration and market power issues, leading to more effective competition and reducing prices
- Create a level playing field which grants cross-border trade opportunities to large and smaller Market Participants
- Reduce risk for all market players by providing opportunities to hedge risk in different timeframes
- Optimally use existing transmission capacity and clearly signal the demand for new capacity
- Provide signals to generators and load about where to locate future facilities; potentially creating efficiency benefits in the longer term
- Provide a clearer and more stable framework that can reduce barriers to entry into markets
- Remove arbitrary distortions and disincentives to trade caused by differential market rules
- Deliver economies of scale through the coordination of many existing practices
- Facilitate the integration of renewable energy by providing liquid Intra-Day Markets in which positions can be fine tuned

IPTO, which is responsible for both management of interconnections through capacity calculation and forward capacity allocation and the operation of the balancing market is working towards enabling smooth transition to the target model by developing major IT projects, the Market Management System and the Cross-border Management System. We believe that within 2019, the necessary systems will be ready to go live for market participants, triggering the time window during which the coupling of the Greek market with the rest of the European electricity markets will be achieved.

We believe that, thanks to the harmonious cooperation with all involved parties, the transition to the new market model and the market coupling with the pan-European markets will be achieved, sooner than when most believe



we could. Of course, that will be possible only with a lot of hard work and commitment to the tight and demanding time schedule.

Thank you for your attention.

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