

Europacable's Dr Volker Wendt reflects on how underground cables are to become a key technology for future European electricity grids

# Taking things underground

**ON** 18 November 2015, the European Commission adopted the second list of Projects of Common Interest – so-called 'PCIs'. The key novelty is that of the 108 electricity projects, 27 are now double labelled as 'electricity highways' to mark their relevance for Europe's future electricity highway system. Of these 27 priority projects, it is foreseen that 21 could be using underground or submarine cable technology. This manifests a general trend: underground and submarine cable technology has become a key technology option for Europe's future grids. With this article, we would like to outline the background to this development.

## Europe needs more grids

Whether it is the recent conclusion of the eHighway2050 project, ENTSO-E's (the European Network of Transmission System Operators) 'Ten Year Network Development Plan' (TYNDP), the Commission's 'Energy Union Package', or the 15% interconnection target to be reached by 2030 as agreed by heads of states and governments in October last year, there is a clear and resounding message that Europe "needs more grids".



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ENTSO-E speaks of some 44,000km by 2030 with up to €400bn of investments needed. The key drivers are clearly identified, notably so for cross-border interconnections, the integration of renewable energy sources, the creation of a truly integrated European energy market and – last but not least – ensuring competitiveness of European industries through securing electricity pricing.

## 30% of grid projects delayed

The need for building these new powerlines is facing one key challenge. In Europe today, it takes on average 15 years to realise new high voltage transmission projects and over 30% are delayed. The reasons for these delays are commonly known as lengthy permitting procedures and a lack of public acceptance. Across the European Union, more and more local pressure groups oppose the construction of new overhead lines. These local 'Not In My Back Yard' (NIMBY) phenomena are increasingly interconnected through new social media and leverage their positions well into local, regional and national politics.

## Underground cables: new technology option for TSO toolbox

So as to respond to these public challenges and to reduce construction times, transmission system operators (TSOs) now have a new tool readily available in their toolbox: underground cabling.

For High Voltage Alternative Current (HVAC) projects, partial undergrounding of up to 20km is being deployed in projects such as the TenneT Randstad project in the Netherlands, the Elia Stevin project in Belgium and the Amprion Raesfeld project in Germany. In the case of HVAC, partially undergrounded sections complement overhead lines in sensitive areas



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and thereby facilitate public acceptance leading to a faster project completion.

For High Voltage Direct Current (HVDC) Projects – used to carry high electricity loads of long distances – underground cables serve to cover longer distances where local consent is difficult to achieve. The HVDC France-Spain interconnector was opened in February 2015 and Germany has just decided to give “priority to undergrounding” for its planned 800km North-South HVDC SuedLink project, due for 2023.

### **Adapting the legislative framework**

As with any new technology innovation, the legislative frameworks need to be adapted to allow society to embrace technology options. On 3 December 2015, the German Bundestag adopted a legislative proposal allowing more undergrounding to be deployed in building Germany’s 2030 grids needed for the ‘Energiewende’. Underground cables will have priority for any future HVDC project, and partial undergrounding upto 20kms will be made possible for specifically identified projects. With that, underground cables will be at the core of Germany’s future backbone electricity infrastructure.

### **Cost: CAPEX versus OPEX**

In many of the public debates on undergrounding, cables are dismissed as being too expensive. These debates unduly focus on the initial investment costs (CAPEX) without looking at costs over the entire lifetime of the project during operation (OPEX), nor do they factor in the costs arising to society of “not having the line”. The German legislation acknowledges that undergrounding can facilitate a faster project realisation through greater public acceptance, triggering a societal benefit (also in financial terms) and a positive OPEX. A recent study conducted by the German Federal Ministry of Economic Affairs concludes that the average consumer will face an increase of €3.40 to €9.10 per year on his electricity bill due to undergrounding. The cost to society of not having these lines due to further delays would be significantly higher.

### **Cable industry ready to deliver**

In Europe today, there is an increasing concern regarding the “de-industrialisation of the old

**TenneT 380kV AC Randstadt Project**



continent”. Little is it known that the world’s leading and biggest cable manufacturers are European, members, in fact, of Europacable. We have the knowhow, the technology leadership, the R&D and the manufacturing of high voltage underground cables in Europe, and yet most of our products are deployed outside of Europe. The European cable industry is ready to deliver underground cables developed and produced in Europe to the European market. Employing 70,000 people and generating a turnover of more than €20bn in 2014, the wire and cable industry has the technological knowhow and capacity to assist the building of Europe’s 2050 power transmission grids. This said, the industry calls for a stable regulatory framework which allows it to properly forecast its investments.

### **Future grids**

Europe’s future grids need to be reliable, affordable and acceptable for our societies. Only then will they be built in time to secure Europe’s competitiveness in an ever more electrified future. As can be seen from the recently adopted second PCI list, underground and submarine cabling will become a standard option for Europe’s future grids. Europe’s industry is standing by to realise this.

### **About Europacable**

Europacable is the voice of all leading European wire and cable producers. Its members include the largest cable makers in the world, providing global technology leadership as well as highly specialised small and medium-sized businesses from across Europe. Our members employ over 70,000 people globally, of which more than 50% are in Europe generating a turnover of above €20bn in 2014. The product scope of our members covers the full range of energy and communication cables. Europacable is listed in the European Commission’s transparency register under 453103789-92. We are a partner of CENELEC.

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