

## Smart wires response to CRE Public Consultation N°2020-005 – 10-Year Development Plan of the Transmission Network by RTE

### Introduction

Smart Wires is the world leader in grid optimisation solutions that leverage its patented modular power flow control technology (MPFC) to maximize the utilization of electricity networks. We work closely with over 100 transmission companies from around the world and were recently identified by the World Economic Forum as one of the three most important grid innovators in the past decade (2010-2020)<sup>1</sup>.

Smart Wires has partnered with RTE for many years to understand how our technology can optimize the use of the French transmission system. We have found that RTE demonstrate best practice with respect to embracing and implementing new technology. In our experience network operators can be hesitant and slow in the adoption of innovative and transformative technology, this has not been the case in our collaboration with RTE.

We welcome the opportunity to provide feedback on the 10-Year Development Plan and have some suggestions on how it can be further developed, in particular we suggest the following should be considered by CRE and RTE:

1. A larger emphasis on Grid Optimisation in conjunction with Smart Asset Management to ensure maximum value is extracted from existing assets before deciding to invest in upgrades or new assets.
2. The Cost benefit analysis should properly account for the value that new technologies can add through their fast delivery, scalable and redeployable nature to ensure maximum value is delivered to the end consumer. Planning should consider the ability of technology to respond to changed needs and to reduce the risk of stranded assets in an uncertain future.
3. Using an outcome-led approach to decide on a solution rather than technology led. For example, battery storage is emphasized greatly throughout the document without consideration for other technologies like MPFC that could be more effective in certain situations.
4. The digitally empowered grid of the future will enable much higher utilization of existing and new grid assets. This will deliver a large step change in network capacity at low costs with minimal environmental and community disruption. It will also reduce the risk of stranding of new investments. In order to achieve this, we recommend the roll out of a strategy to enable all key network elements have digital power flow control capability by 2030.

In this response we are also pleased to share our views on some of the regulatory mechanisms that we feel best incentivise the adoption of innovative technology that is core to enabling the energy transition.

### Coupling Smart Asset Management with Grid Optimisation

Smart Wires notes RTE's emphasis on using technology to create a system of Smart Asset Management within the "Renewal" section of the development plan. We commend this approach to

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<sup>1</sup>[http://www3.weforum.org/docs/WEF\\_Transformational\\_Energy\\_Innovations\\_2010\\_2020.pdf](http://www3.weforum.org/docs/WEF_Transformational_Energy_Innovations_2010_2020.pdf)

actively monitor assets in order to intelligently target the critical assets that need upgrading. We think that it is also important to look beyond Smart Asset Management to ensure that assets are being used to their full potential during their viable lifetime.

One of our core beliefs is that a key component of the success of the energy transition is optimising existing grids first and build new ones where needed. We think that the plan could be expanded to address this.

Optimising the use of grids using new technology can release significant additional capacity. National Grid in the UK are completing Modular Power Flow Control Projects this year that will release 1.5 GW of additional capacity across three congested grid boundaries.<sup>2</sup> Our studies have shown that similar scale capacity can quickly and efficiently be released on most transmission networks.

Throughout Europe Transmission System Operators are experiencing significant delays consenting and developing their high voltage networks, taking many years to identify and address environmental, community and administrative concerns. The delays to increasing transmission capacity is impacting market efficiency at both national and European level as well as adding to the cost of infrastructure. By optimizing existing grids, TSOs can defer high cost investments until there is greater certainty concerning their need and can mitigate against delays that often go hand in hand with upgrading or building new lines.

### Using Social Cost Benefit Analysis (SCBA) to capture maximum value to society when evaluating solutions

As the multiple scenarios in the plan suggest, there is uncertainty in the future of the grid and we believe that the best plan is one that fully recognises this uncertainty at its core. The longer the time frame between identification of a solution and its delivery the greater the uncertainty around the need for the solution. This often leads to oversizing of investments and a risk of stranding. It also means that the grid can struggle to respond to emerging new needs in a reasonable timeframe.

It is much easier to predict needs in a 1 to 5-year window than a 10+ year window. New technology solutions that can be delivered in under 12 months, scaled up or down over time as needs become clearer and can be easily moved to provide a highly resilient capability. This enables the solutions to respond to scenarios as they unfold and to meet system needs faster.

Incentivising such technology through creating a CBA that fully captures the societal benefit (Social Cost Benefit Analysis or SCBA) of an asset is key to their ultimate adoption. We have identified some metrics below that may be helpful in considering the degree of flexibility a solution provides:

The **fast commissioning and delivery** attribute ensures that the need is remedied quickly, and society can reap the rewards of reduced congestion sooner while also avoiding the issue of planning for new lines or upgrades. This also reduces the time between investment decision and delivery, it allows for an investment decision against uncertain scenarios to be deferred until more clarity on the exact need emerges.

The **scalability** attribute means that a solution can easily be scaled up or down over time as needs evolve. This means you do not need to front-load an investment and install a higher capacity than the current need. Instead, you install what is needed to tackle the present issue, while resting assured that if the need increases the solution can be scaled up. This is particularly relevant in the

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<sup>2</sup> <https://www.smartwires.com/2019/11/26/nget-release/>

French context given the high degree of uncertainty relating to the network needs beyond 2030. Projects that are justified in whole or in part on post-2030 needs are carry a high risk of being in correctly sized.

The **ease of installation** attribute means that the solution can easily be moved to a different location on the grid if the location of the problem changes. As distributed generation continues to grow, the areas of congestion on the grid are likely to shift. By using a relocatable technology, you are ensuring that an investment made now will not be a stranded asset in a couple of years, but instead a flexible tool that can be easily moved to solve issues elsewhere.

An excellent example of such technology is the Smart Wires Mobile solution. As demonstrated by the FLEXITRANSTORE project<sup>3</sup>, the assets are deployed to solve a transient yet critical issue on the grid and can be moved easily via road transport when the need is no longer there.

### Cross Border Needs

These benefits can also be applied to solving cross border capacity challenges. The increase in interconnection between France and its neighbours presents an opportunity for improved grid optimization and flexibility. The proposed increases in cross boarder capacity and renewable investment are expected to place increasing challenges on the French network, as illustrated by RTE's 10- year plan. We recognise the intention to complete network reinforcement in the latter half of the plan, to manage the uncertainty of these drivers. We support RTE's approach, however think there is a greater need to consider flexibility and grid optimization as part of this rather than as a separate aspect of grid development.

### Objective-led analysis over technology-led

Throughout the "Flexibility" section of the plan there are many references to battery storage and system services. The roles of these tools are rightly called out as being crucial to the energy transition in order to manage peaks and congestion in the context of increased renewable energy. We feel that this description of flexibility as it appears in the document is limited and should be expanded upon to include other technologies such as power flow control.

We believe the focus of flexible alternatives should be on the outcome rather than the technology/tool as this would deliver the most appropriate solution and lowest cost. Smart Wires have found cases where optimally placed SmartValves are considerably more effective at alleviating overloads than battery storage when comparing similarly sized solutions. Market analysis also shows a lower direct purchase cost for SmartValves™ than battery storage. Additional benefits are also seen in the short installation time of less than 6 months.

### The Digital Grid and Flexibility for an uncertain future

The Digital Grid is becoming more and more important for TSOs, and is highlighted as a core lever of RTE's strategy. We wanted to share our enthusiastic agreement with this as a core pillar. Digital controllability is at the centre of Smart Wires product design and the on-going development of our technology. Our vision is that the grid of the future will be fully controllable and that the distribution of power flow on each line will be digitally dispatchable. We believe in a grid that is active rather than passive and is efficiently scheduling every line in the network in real time to ensure clean power is as widely available as possible.

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<sup>3</sup> [http://www.flexitranstore.eu/sites/default/files/publications/FLEXITRANSTORE\\_Press-Release\\_Issue-1.pdf](http://www.flexitranstore.eu/sites/default/files/publications/FLEXITRANSTORE_Press-Release_Issue-1.pdf)

Given the levels of investment planned for the French grid, we see immense value in carrying out a digital transmission study that includes digital MPFC on all grid assets. The ultimate goal would be to create a digital French Grid that actively and automatically ensures latent capacity is utilized, constraints are kept to a minimum, and that as much renewable energy can be used as possible by the French consumer. The implementation of such an initiative could be phased over 10 years, and would safe-guard the grid against the uncertainty addressed in the scenarios within RTE's plan and that ultimately faces Europe as a whole in our pursuit of Net Zero.

## Concluding remarks

At Smart Wires we are very passionate about facilitating the energy transition, and are aware of the crucial role Regulation and Regulatory Authorities have to play in the overall goal of Net Zero 2050. We are acutely aware that a regulatory environment that encourages and rewards the adoption of innovative clean technology will be instrumental to the energy transition of the Power sector.

As illustrated in our above response, we believe that regulatory principles which favour *optimisation over reinforcement and reinforcement over new construction* should be considered best practice. Using existing assets to their maximum capacity means that maximum value is extracted and cost to the end consumer is ultimately reduced.

We see massive value to the French consumer in carrying out a study to assess the impact of a fully digital grid that has MPFC on every line. Digital controllability and visibility are core to managing the uncertainty of the future and we are confident that MPFC is central to that future.

We also support the idea of using Social Cost Benefit Analysis (SCBA) when evaluating the best solution or project, we believe that all cost benefit analysis should consider the following

- Support for the achievement of government policy objectives
- Flexibility of the solution (its capability to adapt to changing situations e.g. scalability and redeployability)
- Deliverability of solution and risk of delays
- Disruption to the environment and communities by the works required to deliver the project

At Smart Wires we are excited to continue working with industry-leading experts such as RTE towards the shared goal of decarbonisation. We hope our thoughts on the 10-Year plan prove useful to the CRE in your assessment of the ultimate output.

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