The SuperSmart Grid
& Europe's Electricity Story

CONNECTED = EMPOWERED

Renewables Grid Initiative

Contents

The 60 second st

VISION →

- Electricity is the lifeblood of modern society, it empowers almost all aspects of our lives
- In Europe we have an amazing opportunity to harness infinite sources of clean, renewable power
- We will use renewable power to meet Europe's surging electricity demands, drive economic growth, and greatly reduce our dependence on fossil fuels
- The SuperSmart Grid will connect us to this future

SHIFT →

- Today's grid makes the vital connections that empower our way of life, but as we transform our power system, they will need to be transformed too
- Renewables present two key challenges: the places that generate the most renewable power aren't near the places where we use the most electricity; and we can't control when the wind blows or how much the sun shines
- So how will we make renewable electricity reliable electricity?

tory

SOLUTION →

- The SuperSmart Grid will connect all of us to Europe's renewable energy future
- 'Super' means the grid will reach far enough to connect enough renewable energy sources to create a reliable energy supply right across Europe
- 'Smart' means the grid will enable us to generate and use electricity more intelligently
- The SuperSmart Grid is essential to Europe's renewable future, so what is holding us back?

MAKING IT HAPPEN

- Grid development must address legitimate concerns about the impact it will have on communities, health and wildlife
- Policy and technical ability must facilitate not hinder our renewable future, particularly when it comes to necessary grid development
- We must work together to ensure that the vital connections are in place to empower us today and into the future
- Because connected = empowered

Vision

EUROPE'S RENEWABLE FUTURE

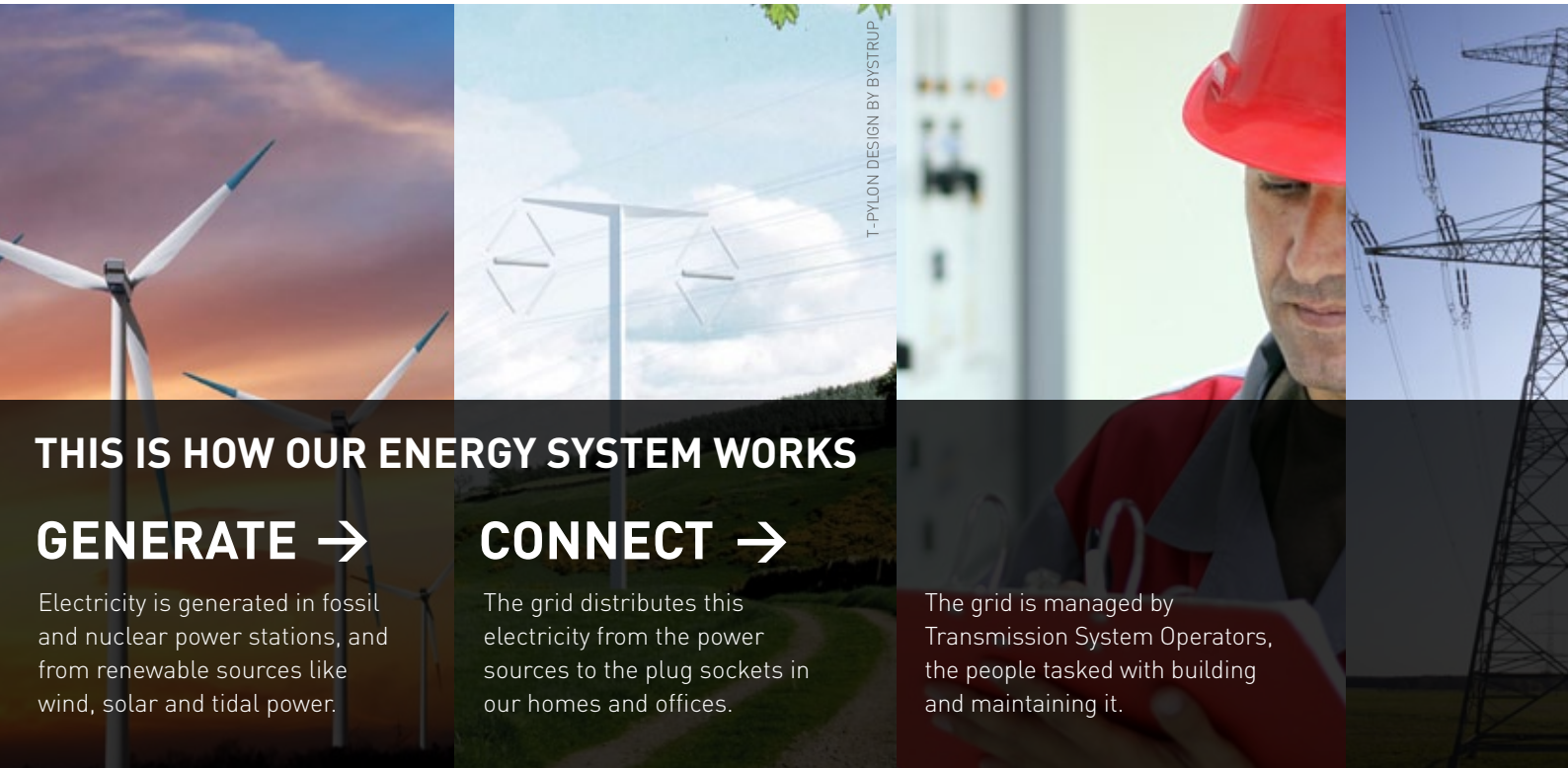
Europe has vast and largely untapped sources of renewable energy. From the sun-drenched Spanish plains to the windy seas off northern Scotland, this powerfully diverse continent has the capacity to meet its own surging energy needs by mostly renewable means.

By sourcing much more of our energy in this way, we are liberated from a dependency on traditional fuels. We can cut huge amounts of carbon emissions in a cost-effective way and make the energy sector a driver of innovation, creating new industries and jobs across Europe.
In addition, if we expand our energy system beyond Europe's borders, we have the chance to access more renewable resources whilst strengthening cooperation with our neighbours.

The transformation in the way that we produce power will be matched by a transformation in the way we distribute it. With renewable generation must come the renewables grid: a system that can bring Norwegian wind power to Italian homes, solar power from Spain to cities in Germany; an intelligent system that can transport information as well as electricity, telling individuals and appliances when power is most abundant and least expensive.

This will be an international collaborative enterprise that will enable Europe's collective renewable energy future, providing clean, secure, affordable and reliable electricity for all.

Delivering this transformation will require a genuinely 'people powered' revolution in which enlightened consumers are actively engaged in supporting a European energy system that is fit for the twenty-first century.



EMPOWERED BY ELECTRICITY

Electricity empowers us. Everything from our first hot drink of the day to the bedside lamp we read by at night requires an instant and constant supply of electricity.

Electricity powers our computers and our Internet connections. It chills our beer and plays our favourite TV shows. It lights our football stadiums, amplifies our musicians, runs our hospitals and drives our trains.

And it does all that at the flick of a switch. Electricity never runs out. Electricity is always there. It is an indispensable yet often invisible part of our day-to-day lives. We depend on it, but we rarely think about what it is, and where it comes from.

The best way to appreciate the significance and benefits of electricity is to imagine life without it. Life without lighting, travel and entertainment; practically every aspect of our lives would be fundamentally compromised by its absence.

That's why it is essential that we can guarantee a safe, secure and reliable supply. How are we connected to the sources of our electricity? How do we make sure it arrives exactly where and when we need it? What links our electrical equipment, from washing machines to games consoles, through the plug socket in the wall to the actual energy that brings them to life?

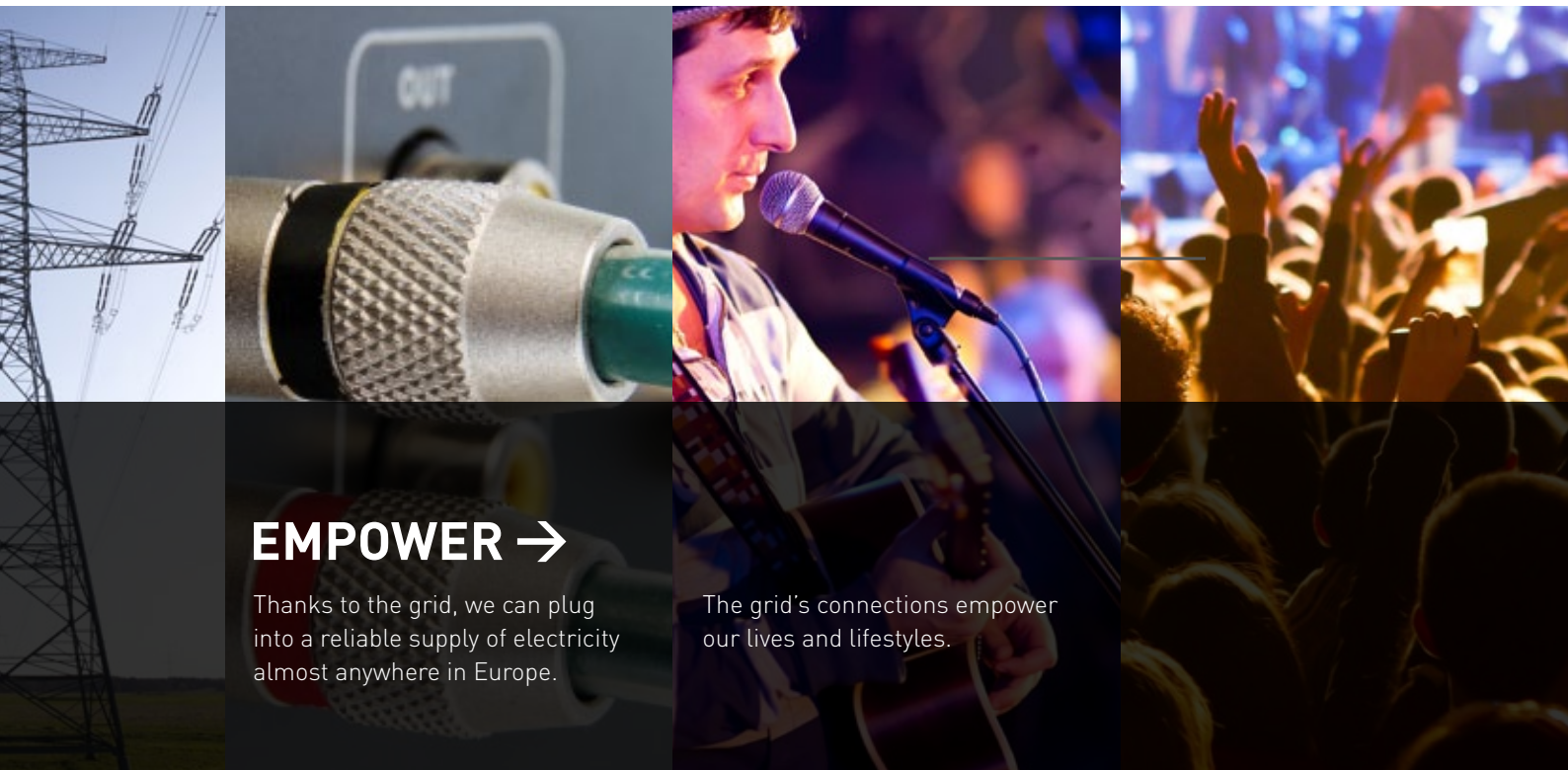
The simple answer is the grid.

WHEN WE PLUG IN OR SWITCH ON WE BECOME AN INTEGRAL CONNECTION IN AN AMAZING, COMPLEX AND INTERLINKED ENERGY SYSTEM.

The electricity grid is a vast and complex network of transmission lines that connects the places where electricity is generated to the places where it is used. The grid delivers reliable electricity to millions of plug sockets in millions of homes and businesses every day, almost instantly. When we plug in or switch on we become an integral connection in an amazing, complex and interlinked energy system.

Grid operators are key players in ensuring the stability of this energy system. They're responsible for operating and building transmission lines and safeguarding everyone's electricity supply.

The grid has been extremely successful at empowering millions of people and businesses across Europe with a reliable supply of electricity. However this system faces new challenges as we begin to transform the ways in which we generate power.



EMPOWER →

Thanks to the grid, we can plug into a reliable supply of electricity almost anywhere in Europe.

The grid's connections empower our lives and lifestyles.

OPPORTUNITIES AND CHALLENGES OF RENEWABLES

OPPORTUNITIES →

Virtually unlimited resources, unlike traditional fuels which are finite.

Most renewable energy sources, such as the wind, sun and tides, are free, unlike traditional fuels which will become increasingly expensive.

Available right across Europe.

People and businesses can produce and even sell their own power using renewable energy sources like solar panels.

Don't contribute to climate change.

CHALLENGES →

Mainly have to be harnessed where they are found, unlike traditional fuels which can be transported to where they are used for energy generation.

The power output is often variable. For example, it can depend on when the wind is blowing or sun is shining.

Shift

A NEW POWER SYSTEM

Today in Europe, most electricity is produced from fossil fuels and nuclear. The continued dominance of traditional energy sources in Europe's energy mix is fundamentally unsustainable. But things are changing.

There are two main challenges:

- **Climate change**

  Fossil fuels emit carbon dioxide when they are burned, which contributes to global warming. Our use of fossil fuels to power our electricity generation is unsustainable; the 30 dirtiest power stations in Europe were responsible for 10 percent of all European Union carbon dioxide emissions in 2006.[1]

- **Security**

  The age of cheap fossil fuels is coming to an end. The future will see fossil fuel prices rise as reserves become increasingly hard to access, and as the risk of environmental damage associated with extracting them grows. Europe already imports a large percentage of its fossil fuels and this number will continue to rise over the coming years.

  Renewable energy sources are different. Resources like solar, wind and tidal power are infinitely available, and they don't emit carbon dioxide.

  A power system that draws most, if not all, of its energy from clean and free sources is a tremendous opportunity, but also a necessity if we are to empower Europeans whilst tackling the twin challenges of climate change and energy security.

[1] Dirty Thirty, WWF, 2007

It is no longer a question of 'if' we require a shift to renewable energy, but how we will make it happen. A renewably-powered future is exciting, empowering and well within our grasp.

The grid has a vital role to play in making it happen.

TRANSFORMING THE GRID

A significant shift to renewable energy sources will transform Europe's power system, making new demands of our existing grid system.

Shifting to renewable energy generation isn't just a case of building more wind turbines and 'slotting' them into the grid. The grid that we currently use was designed to work mostly with fossil fuels. Whilst it can accommodate some renewable energy sources into its infrastructure, accommodating enough to combat the joint challenges of climate change and energy security will require a more radical transformation.

This is because renewable energy sources are fundamentally different to fossil and nuclear energy sources. Renewable energy is clean, secure and won't run out. However, we are less able to influence where and when they generate the power we need.

A RENEWABLY-POWERED FUTURE IS EXCITING, EMPOWERING AND WELL WITHIN OUR GRASP.

For the grid, the shift from traditional to renewable energy sources presents two main challenges:

- **The grid needs to connect remote and varied power sources to the places where we use electricity.**

  Throughout the history of our power system, we have built power stations near the places where the most electricity is used, like large cities and industries. We then transport coal, gas and uranium from all around the world to fuel those power stations. But, because we can't relocate the wind, sun and waves to where we need them – we use the grid to bring them to us.

  Imagine a large farm built miles from anywhere; it's close to the resources it needs (land, water and a good climate for growing vegetables), but miles from anywhere else. Unfortunately, the farm only has one narrow road connecting its produce with the markets that will sell it. Although the farm can harvest lots of fresh vegetables, it can't transport enough of them quickly enough and they are wasted. The farm is not making the most of its production ability.

  In order to thrive as a useful resource, the farm needs a highway big enough to connect it usefully into the local economy. In order to maximise the utility of renewables into our power system, we'll need to strengthen the links between remote areas of generation, like offshore windfarms, and busy urban centres.

WE'LL NEED TO STRENGTHEN THE LINKS BETWEEN REMOTE AREAS OF GENERATION, LIKE OFFSHORE WINDFARMS, AND BUSY URBAN CENTRES.

  To really make the most of renewable generation across Europe, we need to harvest electricity from a wide variety of sources, like large windfarms in the North Sea or solar arrays in Greece and Italy. We also need connections that enable thousands of individuals with a solar panel on their roof to feed into the grid.

- **The grid needs to gather a reliable supply of electricity from energy sources that are by their nature variable.**

  Today, a surge in European electricity demand is usually met by 'turning up' the output of fossil-fuel burning power stations. We have a relatively high degree of control over how much electricity we want to produce and when.

  However, wind and solar power, the cornerstones of our future renewable energy supply, are weather-dependent and are therefore, as sunbathers and kite-flyers across the continent will tell you, 'variable'. There's no guarantee you will be able to fly your kite in any particular place or at any particular time. Changes in supply of renewable energy occur seasonally – there's more sun in summer than winter – but also in 'real time', when the wind dies down, or the clouds roll in.

  The challenge this presents is similar to supplying a region with enough food. We can't feed a hungry city with one crop or one farm. Potatoes, for example, are only available at certain times of the year and, some years, will have a bad harvest. The solution is to diversify our sources of food – we eat wheat and rice as well as potatoes.

  So, if it's a particularly bad year for potatoes, we have two options: we can either reach further afield to find a thriving potato harvest, or we can plug the carbohydrate shortfall with rice, wheat or something else altogether.

  To reach this secure and reliable food supply, we have created connections that allow us to share all different types of food that are produced across Europe at any time. The further we reach with those connections, the more reliable our supply.

We have made our food supply even more secure by storing food at times of abundance to eat when there's less available.

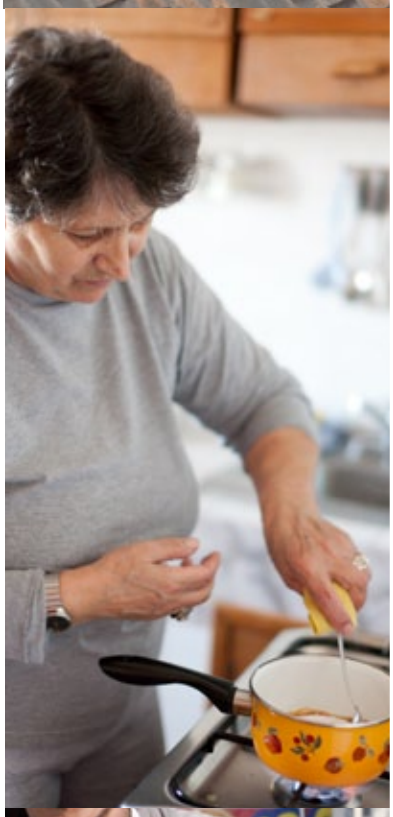
In the same way, to create a reliable supply of electricity from a variable source, we have to connect the different types of renewable generation and storage over a large enough area to meet the needs of our power-hungry towns and cities whatever the season, whatever the weather.

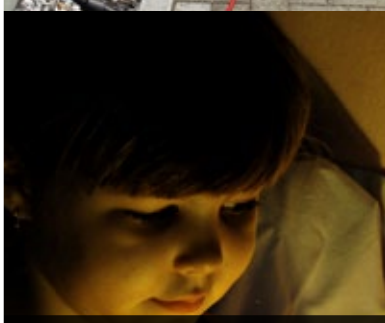
Climate change and energy security are pushing Europe towards renewables, but they're also responsible for a change in the things we'll use electricity for. For example, instead of gas or oil, we'll use electricity to power our cars and heat our buildings. So, instead of filling up the tank with fuel imported from across the world, you'll charge your electric car with solar power from your rooftop.

This will increase our overall demand for electricity, which means the transformed grid also needs to be able to deliver more electricity than ever before. What does the grid that will address these challenges look like?

OLD ↓

Many of us use petrol to power our cars and gas to heat our homes. In the past, this has been the cheapest and most convenient option.





NEW ↑

But we're already starting to replace these power sources with electricity. We have more electric gadgets and appliances in our lives, and are even heating our homes and powering our cars using electricity.

RENEWABLE ENERGY DISTRIBUTION IN EUROPE →

Europe is home to vast and varied sources of renewable energy, from the wind reserves of Scandinavia to the sun-drenched shores of the Mediterranean. Whilst not all countries have the same supplies, the SuperSmart Grid links these specialisms together, supporting a reliable supply of electricity that all of Europe can benefit from.

This map gives an illustrative example of renewable energy sources across Europe. In reality the picture is much more diverse.

Solution

THE SUPERSMART GRID

The solution to these challenges is to create a grid that can connect remote renewable energy sources to wherever electricity is needed, and turn a variable input into a reliable output.

We're going to do that with the SuperSmart Grid – a system that empowers and connects all of Europe, sharing electricity and information across borders, and intelligently matching demand with supply.

IT'S SUPER.

This is a size thing. 'Super' means the grid connections stretch far and wide enough to do two things:

- **Connect remote areas to where we use electricity, and make the most of Europe's specialities.**

  The majority of places where the most renewable power can be generated are not near areas of high demand. And, renewable energy sources can't be relocated.

  The new grid will enable large amounts of electricity to travel from where they're created to where they can be used. The amazing wind resources in the North Sea could power Paris, hundreds of miles to the south, provided the two were connected by a large and efficient power line.

  The Super Grid will also enable Europe to make the most of what its individual countries are best at producing. While the North Sea regions have great wind resources, southern Europe has immense solar potential, central Europe has appropriate areas for biomass, and Norway and Switzerland have large capacity for hydro storage. By connecting these countries together, we can make the most of what each one is best at.

SUMMER →

Different sources of renewable energy are more available at different times of year. In the summer, Spanish Solar Power can be sent to Norway to boost their supplies.

- **Turns many variable sources into one reliable supply.**

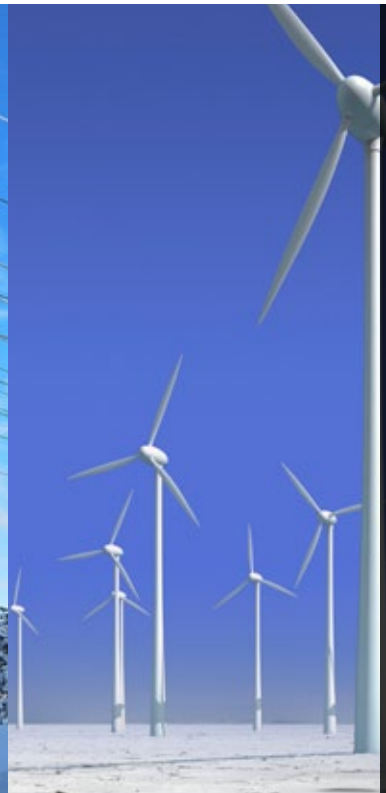
  Weather-based renewable energy is naturally variable, with peaks and troughs: we can't tell the wind when to blow or command the sun to shine.

  By having a grid that is well connected over a much wider area, we can guarantee that there's enough power from sun and wind in the system at any one time to meet our needs.

Today's electricity grids work mainly on a national basis. For example, Polish electricity is made mainly in Poland, German in Germany, and so on. The Super Grid works by connecting all of Europe's regions together. This is the equivalent of a country that's great at growing potatoes sharing its plentiful crop with the rest of Europe. It means everyone can benefit from everyone else, allowing countries to lean on the rest of the continent when they need to, therefore providing reliable and affordable power for everyone.

We'll also be able to store power to cover any shortfall. Large hydro storage facilities in regions with lots of water, such as Norway and Switzerland, will have a big part to play in this. Hydro storage works by using electricity at times of abundance to transport water uphill; when we need to cover a shortfall, we'll release that water back down the hill through a generation system.

So, for example, while Italy will generate plenty of solar power in the summer, the sun might not shine enough during the winter months. However, in the winter, Danish wind turbines will be at their peak and can be pulled in to support the supply of Italy's electricity needs. If we ever start to run low, the water that's been pumped up high in Norway and Switzerland can be released to create enough electricity for all.



← WINTER

In the winter, when Spain is less sunny, Norwegian winter winds can help to power homes and offices in Spain. In a SuperSmart Grid, everybody in Europe helps to keep the lights on.

IT'S SMART.

The Smart Grid provides power in the same way as the normal grid, but can also carry information about the amount of electricity being created and consumed at any one time.

This is important for two main reasons:

- **It allows us to manage our electricity use more effectively.**

  This kind of smart connection means we can match our electricity consumption and production to the patterns of wind and solar energy.

  For example, the future Smart Grid will incentivise electricity users to charge their electric cars when the wind is blowing at its strongest by offering lower prices at those times. Think back to our earlier analogies, the remote farm and the reliable food supply; this is the equivalent of those suppliers being able to communicate instantly with their customers about how much there is left to purchase and offer discounts.

- **It allows us to manage our electricity production.**

  Power lines can only carry so much electricity at a time – too much and they'll overheat. Today, this is easy to manage: when a village starts to use more power, the voltage of its electricity system will drop, which lets the power plant know it needs to send more.

  In a renewable future, we'll get our electricity from a wider and more variable collection of sources. The village will produce electricity as well as consume it. This makes the management of those lines much more challenging, but the Smart Grid provides a solution.

  For example, on a windless and sunless day, a flexible biomass plant might supply the village's electricity needs. If the sun suddenly appears, the village's solar PV panels will create lots of electricity which could threaten the safety of the lines. The Smart Grid will constantly communicate how much electricity is being produced, letting the biomass plant know immediately to drop their input before the lines' voltage rises too high.

  By allowing us to use and produce our electricity more intelligently, the Smart Grid also allows us to reduce its cost.

BEYOND THE GRID

While development of the SuperSmart Grid is a main ingredient in helping Europe reach a renewably powered future, we want to avoid building unnecessary power lines.

There are three key things we can do to ensure this:

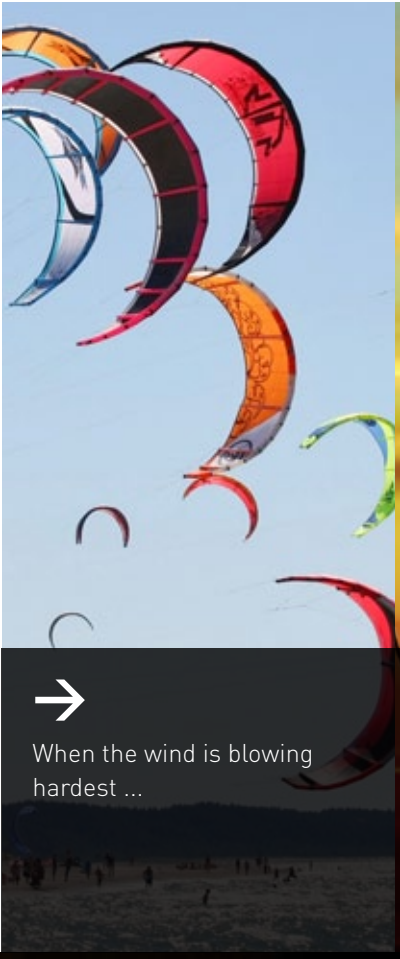
1 Technological advances.

We should always consider alternative solutions before building a new power line. For example, by applying new technology to old power lines, we can optimise how much electricity they're able to carry. In this way, and through European-wide long term planning, we can avoid unnecessary development.

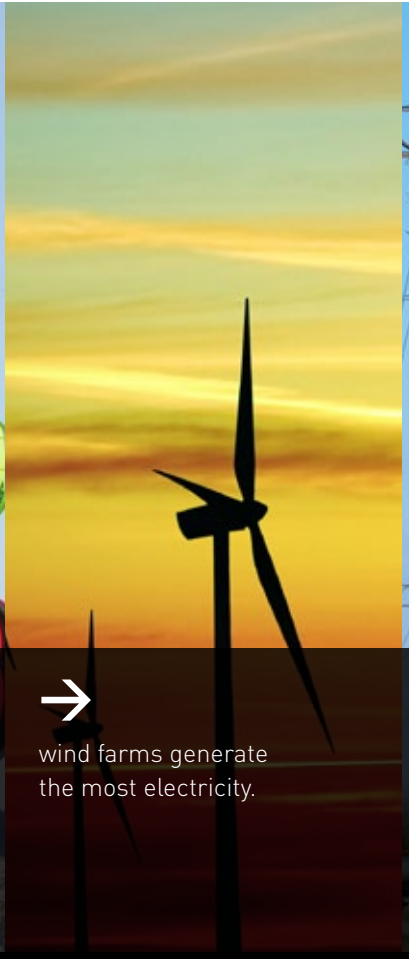
2 Local energy generation.

The more electricity we can generate from local renewables, the less we'll need to transport over large distances. Because of this, roofs covered in PV panels and micro-biomass power and heat plants will have a significant part to play in Europe's energy future.

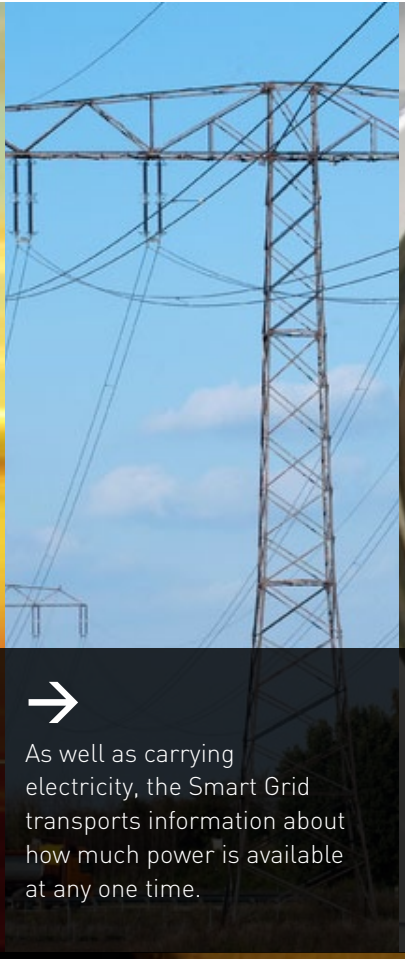
For many areas of low population density, particularly those with a wealth of renewable energy assets, local generation might well cover their electricity needs. In fact, some regions already produce more electricity than they need – by being connected to the grid, they'll be able to



When the wind is blowing hardest ...

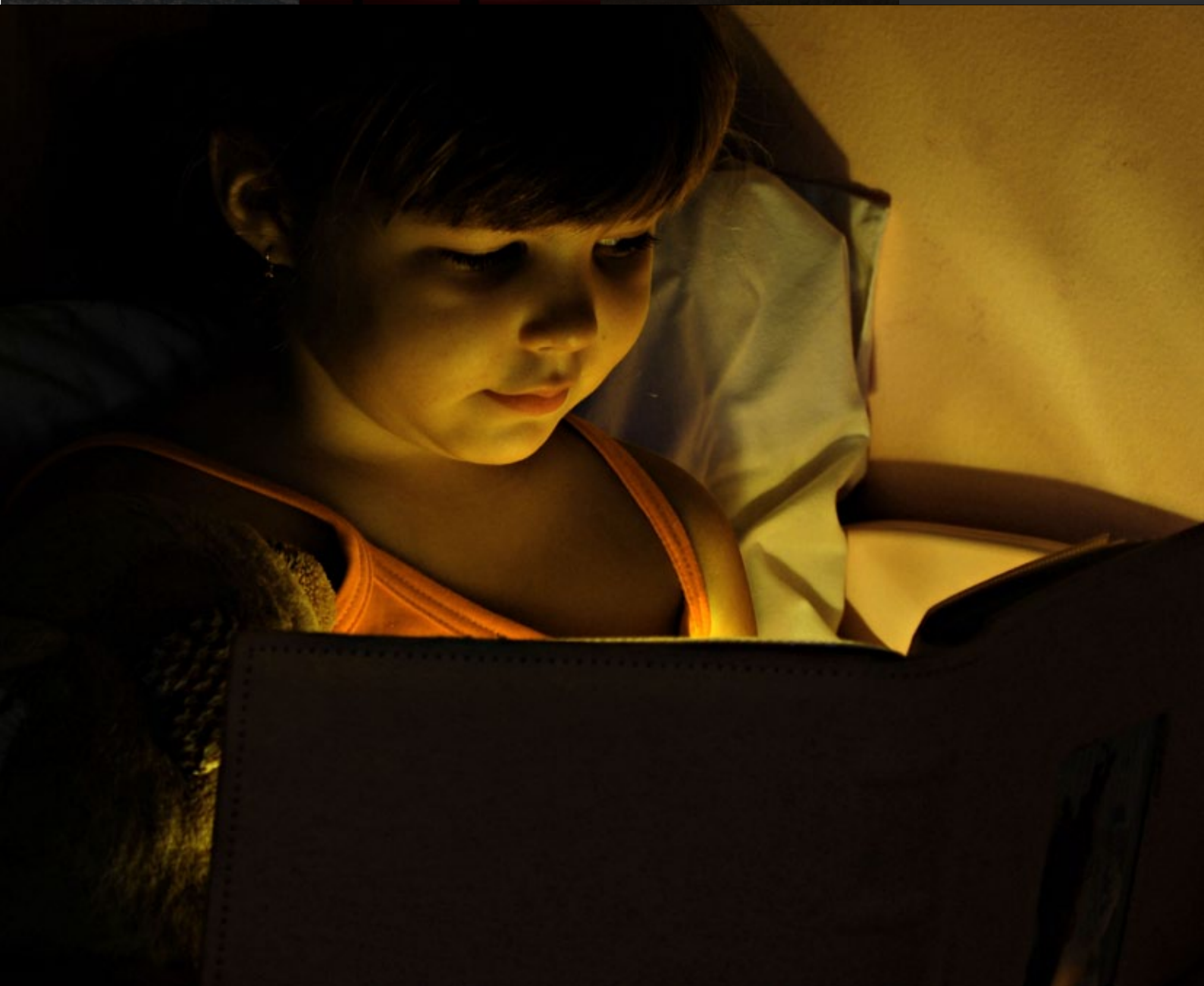


wind farms generate the most electricity.



As well as carrying electricity, the Smart Grid transports information about how much power is available at any one time.

This can help people use power when it's most available and cheap.



sell the excess. Yet this approach doesn't work so well in cities, where demand is greater than the supply of renewable energy resources.

3 Energy efficiency and conservation.

This is a really simple idea: if we become more efficient in our energy use we'll reduce the amount of electricity that has to arrive at our homes or work; which in turn means we'll need fewer new power lines. It is absolutely imperative that we make full use of efficiency and conservation in our overall long term energy strategy.

Transforming the grid is a gigantic undertaking; it's not something anybody wants to do more often than necessary. As we plan for a reliable and affordable energy future for Europe, we are putting in place the foundations for being powered by renewable energy sources.

So, while efficiency, conservation, local generation and technological advances play a vital role in delivering a renewably powered future, they have to exist alongside an expansion of the current grid.

If we don't start transforming the grid today, we'll miss an enormous opportunity to guarantee a secure and affordable energy future for Europe.

So why hasn't it happened yet?

FLOWER TOWER PYLON DESIGN BY ATELIER ONE


Nature Conservation
Natural Resources
Social Conflicts
Economic Recovery
Climate Change
Business
Environment
Water Resources
Human Health
Pollution

Making it happen

REMOVING BARRIERS

The path to creating the SuperSmart Grid has a few hurdles. There are many different stakeholders involved, each with their own legitimate but sometimes conflicting concerns.

In order for the grid to move forwards, all these stakeholders must have a shared understanding of the role of the grid and the need to expand it.

Beyond that, every single stakeholder, from the end-consumer to NGOs, grid operators and policy makers, will have to work together to ensure the best outcome. If you're reading this report, you have a part to play.

We have outlined the main challenges facing the implementation of the SuperSmart Grid below, together with the solutions that should help to overcome them.

1 Strategy Solutions.

We need grid development to happen quickly, but the social and environmental challenges outlined below are slowing down change.

These challenges take many forms, from insufficient staff in administrative bodies (few grids have been built in Europe for the last couple of decades), to a regulatory framework that was developed at national level and is not suited for cross-border development.

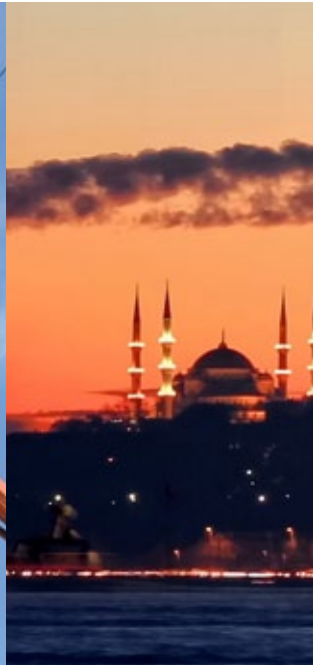
Because these logistical challenges come in so many shapes and sizes, there isn't a single solution. However, there is a shared first step: to spread an understanding of the role the grid has in delivering a secure energy future for Europe.

SOLUTION IN ACTION: Solving the problem of the permissions process

The permissions process for grid development is too long and too complicated – it can take anywhere up to 20 years to get approval for a simple overhead power line. For lines across two or more countries, this approval time increases with each border crossed. At the same time, removing too much of the process risks insufficient consideration of legitimate concerns of various stakeholders and unnecessary development - we have to be careful.

The solution comes in two parts: a more streamlined regulatory framework that uses the same process across Europe, and an overarching European energy strategy that can give weight to requests for expansion. The seeds for both these functions have already been sown, but it's early days!





2 Looking after the environment.

Like any kind of new infrastructure, developing the SuperSmart Grid is going to have an impact on the environment. New lines can impact an area's natural beauty and may have an adverse effect on wildlife. For example, birds and bats can be injured by power lines (although most lines are already being adapted to avoid such accidents).

The potential environmental impact of any new grid development must be addressed as early as possible, ideally in the initial planning stages. This gives all stakeholders, from grid operators to NGOs and environmental authorities, the best chance to work together and come up with solutions that avoid the impacts altogether.

Where the impacts can't be completely avoided, developers have to take steps to minimise, mitigate and compensate them. Whilst difficult, it is also important to recognise the long-term benefit that a shift to renewable power could have on nature and natural spaces.

SOLUTION IN ACTION: New standards to protect birds

Power lines, particularly small and less visible ones, can sometimes harm birds. Large birds such as storks and owls are most at risk because their wingspan can bridge the clearance between a conductor and earthed parts, and lead to electrocution.

However, after years of cooperative work, German NGOs and grid operators have come up with a solution. The standard VDE-AR-N 4210-11 lays out a collection of technical requirements that protect birds.

Most of these requirements require only minor technical adaptations; for example, larger insulating hoods and visual markers substantially reduce the risk to birds

SOLUTION IN ACTION: Increase rather than reduce total number of trees

In every grid expansion project, developers need to compensate for the environmental impact of the new lines.

For example, some trees have to be removed to create new transmission lines in northern Germany; Elia Group and RTE (Belgian-German and French grid operators) are working to replace each felled tree with three new ones close to the project.

SOLUTION IN ACTION: Grid operators make a positive contribution to biodiversity

Elia and RTE are working to improve the impact that transmission corridors have on the environment. The initiative is known as 'Green Corridors'.

Supported by the European Union, these Transmission System Operators want the hundreds of miles of countryside affected by grid development to be enhanced by the process, rather than damaged. They'll work to restore natural habitat, planting low-height local tree species and creating natural areas of pasture for wildlife.

3 Funding the SuperSmart Grid.

The kind of grid expansion we require is going to cost a lot. However, when you compare this cost to those of other energy strategies for Europe, the numbers start to look considerably less overwhelming.

There are two things to consider:

- The grid makes up only a small part of the overall cost of Europe's energy system. In fact, when compared to the cost of new generation capacity and fuel, the grid accounts for only a few percentage points of the overall cost.
- Looking only at the cost of infrastructure is short-sighted. Instead, we must consider the grid's price tag alongside the innovation and employment opportunities it will create. And let's not forget the SuperSmart Grid will banish the long-term financial risks posed by relying on the future security of fossil fuel prices.

In order to attract sufficient funding for the grid, we need a supportive and stable regulatory framework that stimulates investment.

4 Public Support.

Typically, the general public doesn't view grid development as a positive thing. This apprehension doesn't come from thin air: there are a few very valid reasons why people dislike power lines.

Most grids aren't nice to look at, and many people have concerns about the effect they have on their view, their health and the value of their property. Whilst we are convinced that we will need to build more connections to empower Europe's future, we cannot use this as an excuse to bulldoze over these legitimate concerns.

What's more, public opposition is a powerful force; unless we deal in tangible solutions that lead to overall public support of the grid, it will never transform in the way we need it to.

The first step towards these tangible solutions is to make sure that affected communities are engaged in any local development as early as possible. If information about grid development is easily available, and if the local community are able to raise their concerns to whomever is actually building in their area, the shared understanding of the grid will be much more robust.

SOLUTION IN ACTION: An attractive grid

The Dutch grid operator TenneT developed and now uses a new design of pylon in place of the

old-fashioned steel structure. The innovative pylon is called Wintrack and is made from pairs of slender poles. Thanks to their design, the electromagnetic field below the lines is smaller, and pylons can be integrated into the landscape in an attractive manner. The Wintrack pylon is used in the new Randstad380 line built in 2009.

Many other grid operators are holding architectural competitions to find new designs to turn grid infrastructure from eyesores into visual enhancements.

Financial returns for a community or local environmental enhancements can also help win public approval. This would be particularly helpful in combating concerns about the loss of property value.

SOLUTION IN ACTION: Local profit from grid development

The SuperSmart Grid could offer financial gains to the many communities living close to the new lines, particularly those in remote locations. Grids can allow the connection of small, local energy supplies along their route. For example, a grid that's carrying electricity from offshore windfarms to a city further inland could pick up more electricity on route. A village that's generating more from its solar panels than it can use locally could therefore become an energy producer that sells to areas of high demand, such as cities.

WORKING TOGETHER

Each stakeholder has to take certain actions to ensure that the development of the SuperSmart Grid meets the needs of Europeans. By working together, we can deliver a clean and secure electricity future for Europe.

Grid operators:

Continue to acknowledge and understand concerns of stakeholders and address them properly and comprehensively.

- Develop and apply best practice on how to engage all SuperSmart Grid stakeholders from an early stage and be as transparent and innovation-driven as possible.
- Take steps to avoid and minimise the impact of developing new grids.
- Proactively support NGO partners by, for example, supplying data and information that will help NGOs engage with their audience.

NGOs:

Inspire citizens on the opportunity of a renewably powered future for Europe and hold grid operators to account.

- Help the public to understand the "bigger picture" for energy, climate change and the environment by creating a link between local and global concerns and encouraging the public to support new grids where appropriate.
- Guarantee the highest standards of environmental protection and contribute critically but constructively to the process by finding practicable solutions.

Policy Makers:

Understand the impact of their policy choices and be coherent in vision, demand and actions.

- Develop a clear medium and long term vision for energy transformation in Europe, including binding targets for renewables.
- Improve permission processes, seek to increase transparency and educate the wider community on grid development.
- Never compromise on the democratic rights of citizens while ensuring a clean, affordable and reliable supply of power.
- Create a regulatory framework that stimulates the investments needed.

Citizens:

We should seek to understand the impact of our energy choices and be coherent in our vision, demand and actions.

- Continue to become responsible consumers, create demand for renewables and support the necessary grid expansion to deliver it.
- We need to be an active part of Europe's energy future; our actions and choices will be crucial when it comes to developing and implementing this vision.

The Renewables Grid Initiative is working with all these stakeholders to overcome the challenges outlined above and jointly develop solutions.

- To provide a platform for grid operators and NGOs to work together, learn from each other and find new solutions.
- To help policy makers improve the framework for integrating renewables in the grid.
- To communicate to all stakeholders on the necessity and challenges of integrating a maximum amount of renewables into the grid
- To stimulate pilot projects which will lead to a toolbox of solutions that address legitimate concerns and make the grid happen.

About RGI

The Renewables Grid Initiative (RGI) promotes the total integration of renewably-generated electricity into the European grid.

RGI advocates that national and EU authorities should strive to develop grid infrastructure in Europe for both decentralised and large-scale renewable energy sources. This grid development should, wherever possible, be efficient, sustainable, clean and socially acceptable to all stakeholders.

RGI partners

To find out more about the Renewables Grid Initiative and the issues discussed in this brochure, please visit our website - http://www.renewables-grid.eu/

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