Ladies and gentlemen,

Joao, thank you for the invitation to be here with you today. It is a great pleasure to speak in front of some of the brightest minds and most influential thinkers in the sector.

By now you will have all seen our vision for an Energy Union which lays the foundation of an integrated energy market which works for consumers, for making the EU world number 1 in renewables, and for ensuring that energy supply can meet demand.

Innovative smart grids are central to that vision.

They allow energy to keep flowing where and when it's needed, they make the best use of renewable energy sources, and they can keep infrastructure costs and household energy bills down.
We know smart grids work. We have seen that they can reduce the infrastructure capacity needed to meet demand by up to 30%.

But there are a number of hurdles which can hamper progress. These can be regulatory, technological, financial, or organisational.

Over the next two days we will look at how we can overcome those barriers. Today, I want to frame that debate by looking at the three things we need to get right:

- **Firstly**, I want to outline the smart policies which are needed to create the flexibility in the system
- **Secondly** I want to talk about the research and innovation in smart technologies which can help tailor the energy system to fit the needs of consumers
- **Lastly**, I want to look at the smart financing needed to get projects off the ground and to bring new technologies to the market

Before we go into these three points, let's first take a look at the changing energy landscape which provides the backdrop to this event.
(The changing energy landscape)

Ladies and gentlemen,

We are on the verge of a revolution in our energy system. We are witnessing big changes to the way electricity is produced, transmitted and used.

Around 15% of the energy we consume in the EU comes from renewable energy; for electricity the share of renewable energy is already around 25% and this share could further increase to almost half of our power supply in 2030.

The variability of renewables requires more flexibility from the grid. The distributed nature of much of the new generation capacity requires new approaches, technologies and markets.

As part of this change we need to put consumers at the heart of the EU's internal energy market so that they see it working for them, enabling them to control their consumption, lower their bills and benefit from new opportunities.

In short, the energy landscape will continue to transform before our eyes.
And this is a necessary change. It is driven by the need to meet our 2020 and 2030 targets as part of the EU Energy and Climate Framework.

The challenge of climate change is also an energy challenge.

We need to learn how to use our energy more efficiently, and put renewables and smart technology at the heart of our energy system.

These are therefore key elements of what the Energy Union will seek to deliver.

It is an Energy Union powered by people. It will give European citizens a "new deal" to offer them more choice, better services and more control over the way they use, and possibly produce, energy.

All of this will be reflected in profound changes in the way we build and operate our electricity networks.

The projects that will be on display here are already leading the way. They are therefore a practical contribution to the Energy Union.

This does not mean, however, that the necessary changes in the way we build and run our grids will come about automatically. This will, in my view, take three things.
First we need smart policies for smart grids. The integration of renewables requires flexible markets, both on the supply and demand side. This includes that electricity grids must evolve significantly.

A significant change in the topography of the grid is emerging. The roles of the Distribution System Operators are changing. They will have to manage their grids actively using a variety of solutions including storage and demand management.

Consumers will become producers and use smart meters and smart grid to modulate their demand to save money. Demand Side Response has the potential to save 100 Billion Euro per year. This is almost €200 for every citizen in Europe.

All these changes will have to be reflected in our market and network rules. The adoption of further network codes based on current legislation will surely help us with this. It might, however, in itself not be sufficient.

As part of the Energy Union package I will therefore put forward proposals for a new electricity market design to ensure it is better adapted to the energy transition and the challenges I have mentioned. It will focus in
particular on taking a decisive step to guarantee grid security and to integrate all types of generation into the Internal Energy Market in an efficient manner.

The Market Design Initiative will therefore open a wider debate what further changes in our rulebook might be needed. Clearly we will have to ensure that energy efficiency services and demand side measures become an integral part of the Internal Energy Market and that our regulatory framework is conducive to this.

It will also address the issue of self-generation and how to integrate this efficiently into the system.

Finally the internal energy market we are aiming at should also build on synergies between district heating, gas and electricity networks. Heat storage could be an efficient means of getting rid of excess power generation, for example when we have our PV and wind capacities generating at full speed. In some countries such as Denmark, this is already exploited.

Incidentally, the same country is a good example of the value of interconnection for integrating renewables. In 2012 wind generation exceeded demand in Denmark but curtailment was close to zero due to strong interconnection with Germany and Norway.

We have already laid the base with our action plan on achieving our 10 % interconnection target. This is
another area where we want to deliver faster with smarter and more targeted policies. We are pursuing enhanced regional cooperation initiatives to bring about faster realisation of the projects of common interest we have already identified as crucial – be it to connect the Iberian Peninsula, the Baltic States or South-Eastern Europe.

But apart from building new hardware we will also need to be better connected operationally.

To achieve this I invite you to strengthen the close collaboration between Distribution System Operators and Transmission System Operators to help better manage your systems as they become busier and demand more flexibility.

Both are striving for the same thing – smarter, more flexible grids which run smoothly even at times of peak usage. DSOs and TSOs should share the burden when it comes to innovation for finding solutions to problems at the local level.

And they should work on everything from forecasting to managing consumption shifts in order to keep the grids in shape.

To support that the Commission is working on a joint platform for TSOs and DSOs which will be launched
later this year and facilitate data and knowledge exchange between the regulators.
We also believe that there is scope to enhance the cooperation of TSOs across borders to ensure secure system operation. This will also be an important topic of our market design initiative.

**A great example of the co-operation I am talking about was the solar eclipse on the 20th March.** With the solar energy of about 80 medium sized generation units fading from Europe's electrical system before being gradually re-injected, the challenge to the system was clear. Solar eclipses have happened before but with the increase of installed photovoltaic energy generation, the stakes were high.

The TSOs accurately forecasted the effect of the eclipse on solar generation; even taking into account the 'worst case scenario' that the eclipse would take place on a sunny day.

Anyone in Brussels that day will know that was not the case here!

But with meticulous planning they were able to mitigate the risks by putting in place continuous on line coordination between control rooms across Europe before, and during, the eclipse to better coordinate the scheduled remedial actions.
Some people in this room may have been involved and I thank you all for your proactive work.

The example clearly shows what new challenges the energy transition and the new forms of production bring to the electricity system.

(2. Smart solutions for smart grids)

And it also shows the need for innovation to adapt to a changing system. So let me now turn to the second challenge: what kind of innovation and new technologies will we need to facilitate the transition of the grid?

What are the technical solutions we have to facilitate managing grids with more renewables, decentralised generation, new loads, such as electric vehicles, and new services and products?

To put it positively, we have a lot of room for improvement. Millions of European homes rely on century-old analogue metering. This means people have no way of knowing their real energy consumption in any one day. Although EU households often spend more on energy than on their holidays or eating out, people tend to take a real interest in energy supplies only when they
receive their bill – which for most Europeans is still once a year.

Therefore, one such solution that can have an impact on every consumer – big or small – is smart metering

Coupled with smart metering systems, smart grids help consumers adapt their energy usage to different energy prices throughout the day and save money on their energy bills by consuming more energy in lower price periods.

40 million dynamic-demand fridges could provide over 1000 MW of frequency response. This is the equivalent of a large power station that would not have to be built.

Too significant to be ignored!

That is why we are calling for timely roll-out of fit-for-purpose smart metering systems with features that help the consumer, such as updated readings every quarter of an hour.

If Member States' plans materialise, by 2020, almost 3 quarters of European households and businesses will have an electricity smart metering system; that's an investment of 35 billion Euros.

But that investment will only be worthwhile if it is done properly.
That is why we will be monitoring whether the recommended functionalities are used at national level and benchmark progress – so far only 8 countries intend to follow them. I hope more will follow suit.

We will also investigate if the smart metering systems being installed are interoperable and compliant with available standards.

Let me remind you that **smart grid and smart metering standards** are now available - please make good use of them.

And let me also stress the importance of trust when it comes to **data protection and security** in all new technologies.

Without the proper safeguards, it doesn't matter how brilliant the invention – no one will trust it so no one will buy it.

Data protection is not negotiable and I urge you all to use the recommendations we issued for Member States on the protection of personal data in smart grid and smart metering systems.

We will also continue working with you all on the **Smart Grids Task Force** to look at how we can keep a level-playing field for all players in an open and competitive retail market delivering value to consumers.
But given that the number of household appliances has risen by over a quarter over the last ten years we also need to look at how **smart household appliances** can play a role in flexible grids.

The keys to smart appliances are: **automation, communication and information**.

A smart appliance must be able to receive and respond to information about the outside world, beyond just the immediate commands and settings of the user.

It must be capable of responding automatically to the information it receives in a way that is helpful to the user and the grid.

That could mean reducing its energy use, turning off entirely for a brief period, or perhaps turning on when it would not otherwise be operating in order to access cheaper energy.

But automation could help us even further in tapping the flexibility potential of consumers. Smart controllers linked to distributed generation or energy storage devices could respond by discharging stored energy to the grid — for example from an electric vehicle with a full battery that is connected to the grid.

**There are many examples but we need to replicate this sort of consumer centred innovation across the board.**
And we need to understand what barriers are preventing a wider rollout of such solutions.

As world leading innovators you are our most valuable resource. We need to support you to develop new solutions on the interconnectors, storage solutions, smart grids and smart meters that can make the difference.

To make sure that we sharpen the focus of our research and innovation efforts, we will propose an upgraded Strategic Energy Technology Plan.

This will place a greater emphasis on a limited number of priorities and on ensuring better co-ordination between all involved to make sure we can bring the best ideas to fruition.

I applaud the exemplary coordination work you have led in the European Electricity Grid Initiative in bringing together TSOs, DSOs, researchers, SMEs, and Member States to set up research priorities and demonstration programmes.

But we also need to make sure you get the investment you need. Which brings me to my final point for today: We need to put in place smart financing schemes to make sure that you get the access to finance required.
(3. Smart financing for smart grids)

So far €3.15 billion have been invested in more than 450 smart grid projects since 2002. But this is nowhere near enough.

**We need investment in the region of €400 billion by 2020 to modernise electricity transmission and distribution grids.**

Funding for energy research projects has doubled up to €6 bn in the **new Horizon 2020 fund**.

Looking at bigger scale deployment, funds are available under the **Connecting Europe Facility** which has earmarked 5.85 billion for energy infrastructure projects.

We have also encouraged Member States to include smart grids in their plans for the **European Structural Investment Funds** in the 2014-2020 cycle, and some of them have indeed made this a priority.

That is a good start but it is nowhere near the 400 billion needed. Public funding cannot extend that far. But it can – and must - be used as a launchpad for leveraging private finance.

And that is exactly the thinking behind the President Juncker's **Investment Plan and** the European Fund for Strategic Investments. Energy projects will benefit from
much of the €315bn of public and private investments that the Investment Plan will unlock over the next three years.

This will help accelerate infrastructure projects but also investment in research and the better integration of renewables into the market as well as energy efficiency. We want to use this fund as a way to unlock smart grids' potential for delivering economy-wide benefits, lowering the cost of living, and creating jobs and boosting growth.

Many of you have given your feedback as to how that can happen under the Investment Plan and I invite you all to share your ideas over the next two days.

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[Closing]

Ladies and Gentlemen,

Smart, innovative grids are key to the energy transformation we need to meet our climate and energy responsibilities. They cannot reach their full potential without world class research and ground breaking innovation

As I have outlined today there are three conditions for making our common vision of smarter grids a reality, and we are working on all of them:
• The political and regulatory framework is being put in place to bring in all flexibility options we have – witness the Energy Union package and the Market design initiative as our first step to implementation;
• Research and Innovation is being facilitated and new ideas are being brought to the market – witness your own work and commitment, for example to implement the SET Plan;
• The financial incentives are being put in place to allow the necessary investment to come forward – witness the implementation of President Juncker's Investment Plan

Yes, there are regulatory challenges, market implications, and a need to accelerate investment. But the people in this room and the projects showcased today fill me with confidence that we can tackle these challenges head on.

You are living proof that the EU continues to lead the way when it comes to finding innovative solutions to today’s challenges. And I look forward to working with you

Thank you for your attention.