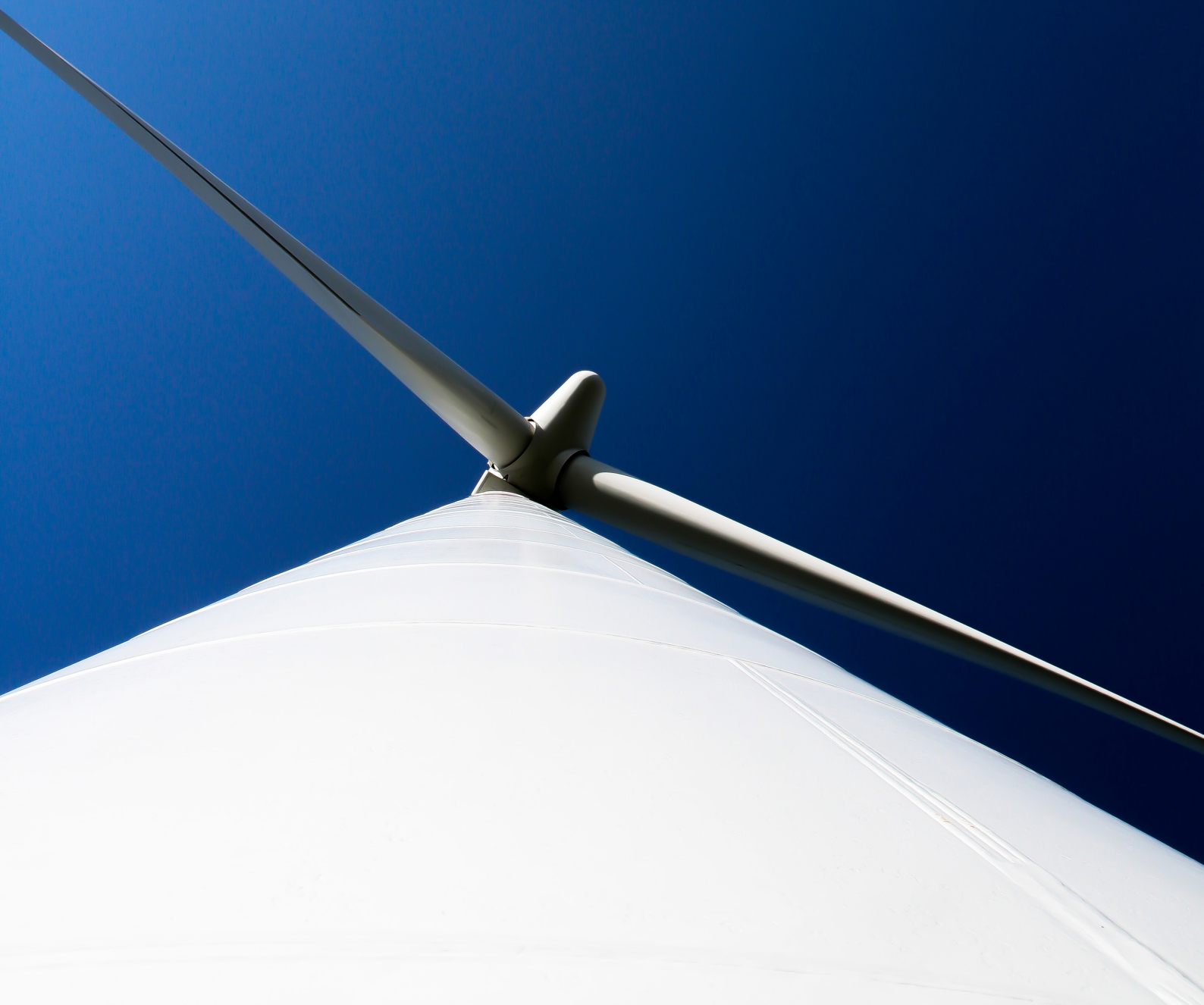


# Wind Power in Europe's Renewable Energy Mix

*The challenge and future of a growing industry*

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A BCCD White Paper



A close-up, high-angle photograph of several rows of solar panels. The panels are dark blue with a grid of white lines, and they are arranged in a perspective that recedes into the distance. The lighting is bright, creating a strong contrast between the dark panels and the white grid lines.

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**“the EU imports 53% of its  
energy at an estimated 1  
billion Euro a day”**



# Executive Summary

This autumn the British Chamber of Commerce in Denmark took membership value to a world class level by the introduction of the BCCD's Industry Consultations as part of its new industry cluster initiative. The BCCD reckons that cluster thinking goes beyond the narrow cost-based view of the business environment by focusing on an extended set of factors that influence the competitive advantage of a group of businesses within a cluster.

The very first industry consultation in co-operation with the British Chamber of Commerce in Germany (BCCG) – which will be following suit in introducing cluster initiatives - looked at the development of the renewable energy sector in Europe with particular attention to the wind industry. The cross border event, organised by the BCCG, took place in Hamburg, the renewable energy capital of Europe. There, experts from both governments and industry, including the UK's electricity and gas regulator OfGEM, Siemens Wind Power, DONG Energy, A2SEA, E.ON amongst other independent experts, explored themes around the future of Europe's energy mix.

Renewable is still finding its way as a cheap sustainable source, though it accounts for around 20% of the energy mix. Within the industry itself, there are many smaller sub-sectors competing against each other. At an aggregate level, they still have to deal with the conventional sources of energy that are still primarily oil, gas and coal. For the electricity market, it is largely up against coal and gas - with Malta, for example, still generating 100% of its electricity from oil. The challenge is which of these sub-sectors is the sustainable option? The wind industry looks promising - giving it a lot of attention lately. To confirm that, regulators juggle with legislation and framework needed to provide market certainty.

Recent geopolitical turns at the northern EU border paint a new picture for renewables. The major driver that was more or less moving towards a green economy has now been replaced by the discussion of an energy security gap that needs to be filled - thanks to the Ukraine crisis. If you are not aware, the EU imports 53% of its energy at an estimated 1 billion Euro a day.

To meet this sudden demand, the industry (particularly the wind farms) must develop a robust growth strategy. In this White Paper, we suggest a strategy that would ensure the industry easy transition to being market driven, while sustaining supply and attracting adequate private investment. While our strategy does not directly address issues such as supply chain and cost efficiency, it does not mean that we did not acknowledge them. We know that constant pipeline for example will strengthen supply chain, drive down cost and increase efficiency. Therefore we highlight that ensuring pipeline projects is important.

On behalf of both Chambers, we would like to thank Osborne Clarke (Hamburg) for hosting this conference and Bloomberg News for moderating it. We are also grateful to our speakers - both industry and regulators, independent experts and all the participants in general whose presence made this event a success.

You will find a summary of all the speakers' presentations accompanied by our brief analyses in the appendix to this document.

We hope you find this White Paper useful and will be happy to hear from you.

*Mariano A. Davies*  
**President & CEO BCCD**

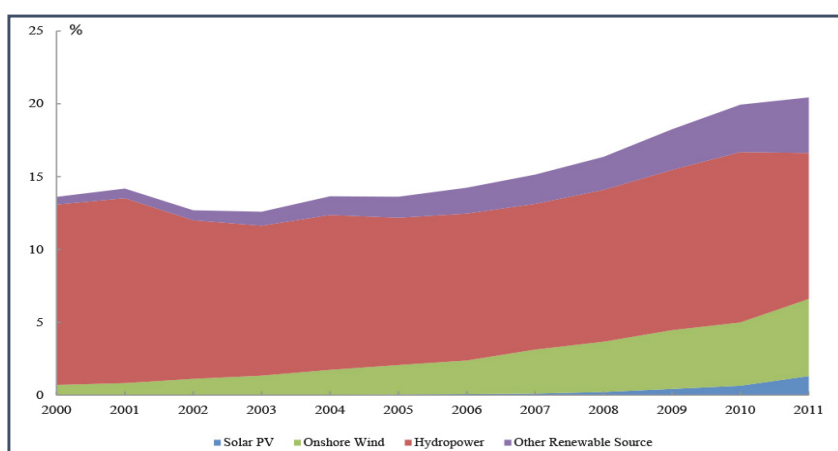
*Rainer M. Giersch*  
**Chairman Regional Group Northern Germany BCCG**



# The Issue

Europe's renewable market is a quiet battleground for market share with many players. Beyond the market itself, it is the political wrangling that slows down new projects and creates an uncertainty that scares investors and limits capital flow to the industry. Particularly for the wind industry, it is competing with new and long standing players. Hydropower remains the highest contributor of renewable energy over the last decade while the solar share is increasing steadily.

## 1. Renewable a silent battle



Source: DG Financial and Economic Affairs/Eurostat database 2014

## Market challenges

### Multiple players – biomass, onshore/offshore wind farms, hydro, solar, geothermal...

A number of new sub-sectors are making headways in the renewable market since the European Council Directive of 2007 and 2009 came into force. Biomass, solar voltaic and solar thermal are just a few that are coming head to head with wind industry towards maturity. As the energy security discourse takes precedence and accelerates decarbonisation commitments, diversifying the energy mix will see even more new players in the market.





### Traditional sources – oil, gas, coal (carbon capture and storage)

Despite the political commitment to increase the deployment of renewable projects, oil, coal and gas still remain highly competitive substitutes. The EU is the third largest coal consuming region after China and North America. The US shale revolution tumbled gas price doubling export to the EU. On the other hand, states like Malta still generate 100% of their electricity from oil.

### A risky supply chain

As a still emerging industry, fast new technologies characterise the supply chain making it a risky and expensive business for the industry. For instance, the strength of the supply chain in the wind industry is limited and weak - even in some of the biggest wind markets in Europe. DONG Energy, a Nordic energy giant, finds it difficult to secure all its turbines inputs in the UK due to the underdevelopment of the supply chain there.

## 2. A supply chain that is still growing

Current UK supply for major offshore components		Risk	
Component	Number of Manufactures		
Turbines 	None	HSE performance	↓
Foundations 	1-2	Quality	↓
Offshore substations 	Several	Cost	↓
Cables 	1	Delivery on time	↓

Source: DONG Energy 2014

## Buyers

Price sensitivity drives buyers' relationships to the industry. Government has strong bargaining leverage due to multiple subsidies that the industry still receives. Most national governments are still politicising energy policies and imposing local content requirements. With the energy security high on political agendas around Europe, consumers are more sensitive to the pricing.

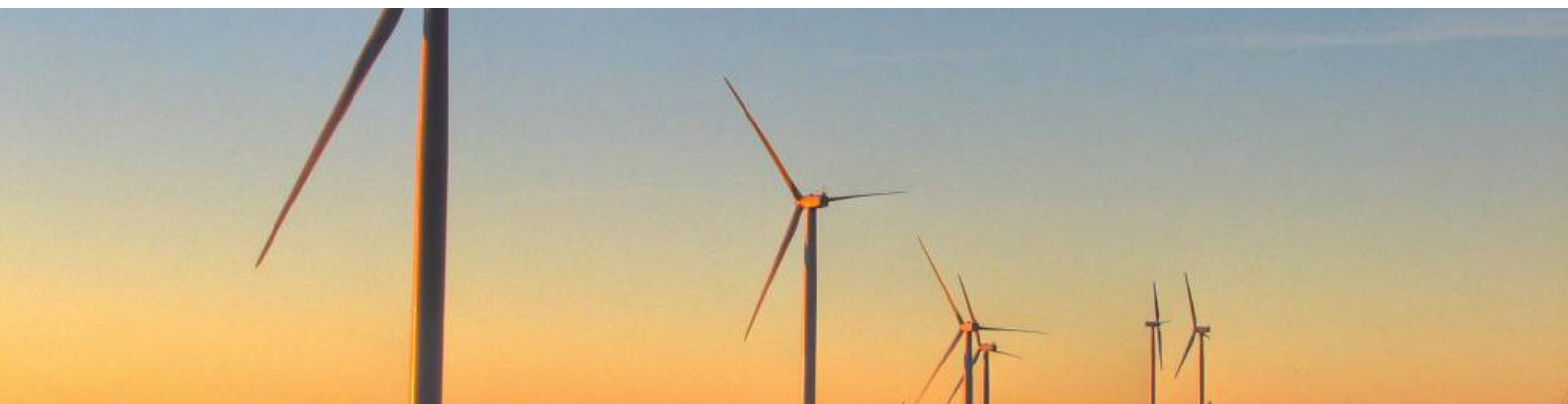
## Beyond the market

A comprehensive non-market strategy is still a long way from what it should be for the industry if politics determines its survival.

Beyond the market is the task of attaining coherent political commitments. EU energy markets largely remains national in scope due to a tradition of strong State involvement. They will provide the market certainty that will attract private investment to spur innovation and lead to production efficiency and greater energy output. The EU broad renewable target is a big step in that direction. However, they must be translated into Member States' targets and be implemented before a reliable market can exist in each economy. Germany, for example, despite previous EU targets, only recently began transitioning to renewable on a massive scale to replenish what will be lost when the nuclear reactors shut down in 20 years.

Even with political commitment, the divergence in legal framework amongst Member States is something the industry will still have to grapple with. EU bodies like the Agency for the Cooperation of European Energy Regulators (ACER) that are fostering coordination amongst Energy Regulators should be seen as putting things one step ahead. The single electricity market will be a game changer at the peak of coherence in the EU. Beginning with the "day ahead market coupling" creating a single market will produce that critical mass.

Finally, the biggest challenge lies in getting the appropriate and credible amount of information out to the paying public. The industry is yet to use to its advantage, the amount of information it has on the true cost of conventional energy compared to that of renewable as a means of aligning the public and governments price concerns with that of investors' expectations. Experts criticise the industry under utilisation of academia for this purpose. Others, such as the financial sector were quite strategic in using the expertise of academia to lend credibility to their industry. Not only did academics raise the financial



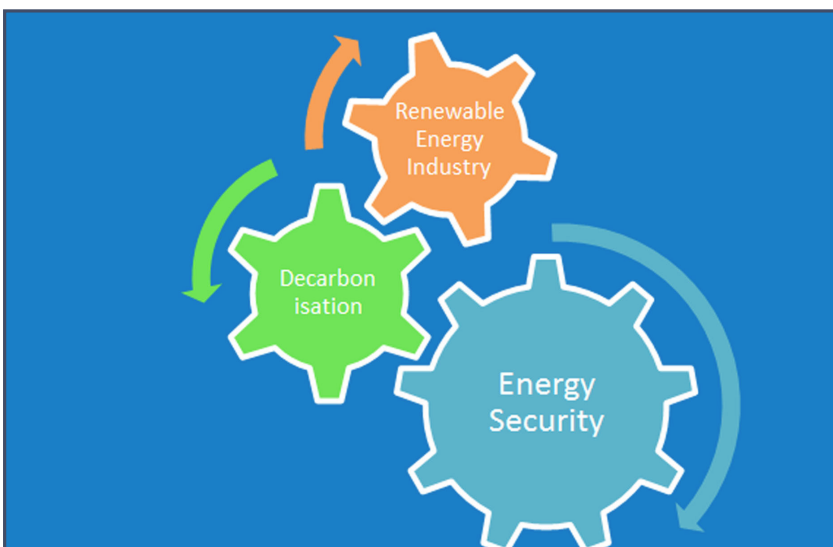


# Background

## A call to fill Europe's energy security gap

Europe's decarbonisation ambition and policies were seen as the main drivers of growth for renewables. However, the question of energy security gives the industry more clout to fill in a potential energy gap - thanks to recent turns in the geopolitics of European energy supply. Energy security is accelerating decarbonisation.

3. Energy security launching the industry to a new era.



Source: Author's model



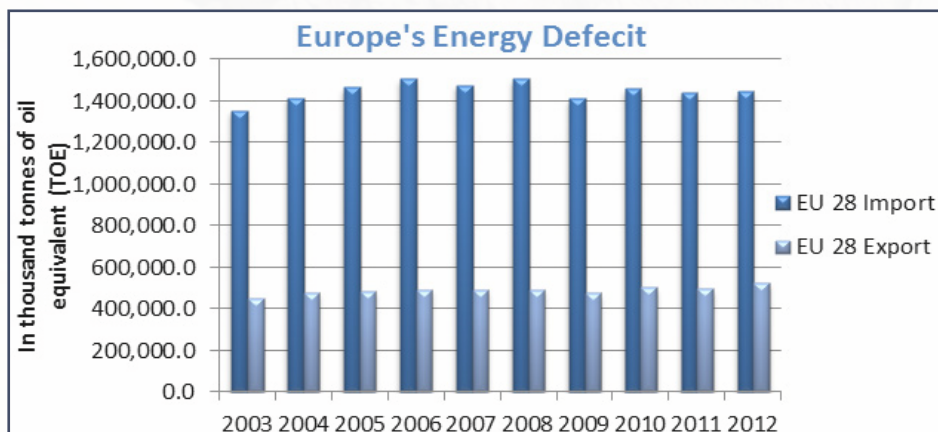


## Why energy security?

A reliable supply of energy remains a formidable challenge to the EU stability, the growth of its industries, economies and the quality of life of its citizens. The recent crisis in the Ukraine has only reechoed what is becoming increasingly worrisome. Unlike the US, the EU is heavily reliant on external energy import - a fifth of its total import bill. Data from 2012 showed that the EU accounts for the following of global reserves: 0.4% oil, 0.9% natural gas and 6.5% of coal. A memo from the Commission in May 2014 reported that between 1995-2012 production in natural gas, oil and solid fuels went down by 30%, 56% and 40% respectively. Filling this local production gap increases import - 88% crude oil, 66% natural gas, 48% solid fuels, 95% uranium and estimated at close to half a trillion Euro a year.

The situation leaves some EU members states and their economies vulnerable to supply shocks from Russia. Russian supplies account for 11% of EU's oil import, 36% of its gas and 26% of solid fuel. Its rising geopolitical assertiveness has a significant energy dimension. An unstable Ukraine, the key transit country for Russian gas that pipes more than 85 bcm to Europe every year, could pose danger to the 19% of EU electricity generation that comes from gas.

### 4. A gap too big to fill?



Source: DG Energy, Eurostat 2014

On the upside, this is good news for renewables that until now were seen as an expensive unreliable earth greening project. It holds the future for filling in the energy gap giving it the opportunity to transform itself into a viable long-term attractive industry.

Like every new industry that suddenly gains political attention, it has prospects but needs to carve out its place in the market. It must create the willingness to pay amongst consumers. Convinced consumers support policies, which translate into continuous renewable projects. A steady flow of these builds a strong case for investment along the entire value chain of the industry - making it attractive. An industry with a compelling business case attracts long-term financing.







# Solutions for Business

## A growth strategy cycle for the wind industry

Applicable across the renewable energy industry, consider the four-stage strategy cycle for wind power. The model shows how the industry can become self-reliant and attractive.

### 1 Publicise the true cost of energy

Building a case for subsidies and getting consumers to pay for the very expensive electricity that is generated by wind power is what the survival of the industry is hinged on. Not only is wind energy expensive to harness, it is also expensive to store and integrate into the grid leaving a high cost relative to other conventional sources. The market sees growth but more complex projects - especially in offshore farms make rising cost an issue according to Siemens, an industry leader. For example, in the UK electricity costs 164 Euro per megawatt hour MWh - compared to 94 Euro from biomass. The amount of private capital the industry can attract to finance projects is determined by price structures that promise an attractive return on investments.

Making a compelling case can only be done by getting consumers to understand the true cost of energy compared to conventional cheap sources. Consumers are not aware that renewables reduce Europe's trade deficit that is half a trillion Euro for energy alone. It further reduces exposure to supply shocks and the volatility of fossil fuel prices as we have seen with oil in the last few weeks. Most importantly, the industry has a huge potential to reindustrialise Europe through innovation in new technologies, create high earning jobs and support greening targets. In Germany alone, the wind power industry employs 25,000 people in Hamburg and politics expect it to add another 100,000 jobs to the German economy over the next three years.

### 2 Ensure constant flow of projects by stimulating political commitment

As the industry moves to harsher environments, a stable flow of projects is the guarantee for companies to level cost by optimising the use of standardised components and work processes. A clear number of projects enhances planning and attracts investment. A2SEA, a company that has installed half of the world's offshore wind turbines, does not see a significant cost difference in the installation of larger turbines compared to smaller ones but points out the value of economies of scale.

An industry that relies on subsidies requires a pipeline of projects for survival. Multiple of those mean volume. But projects today are contingent upon political will. That is why the industry must dedicate a considerable amount of resources to assist governments define clear goals that translate into lasting regulatory frameworks that support all projects.

### 3 Become an attractive industry at any cost

The degree of uncertainty that hangs over projects renders the market unpredictable - consequently an unattractive industry compared to aircraft manufacturing with which it shares a similar subsidy scheme. While aircraft projects are market driven, wind's take years (or even stall) as politicians and governments decide on when to pass the next energy regulation.

An increase in the number of guaranteed projects will make the industry attractive for many participants. An attractive industry will see the cluster and multiplier effect leading to a robust supply chain, which in parts still is in its infancy. The more attractive the industry becomes, the better it will be for the existing and new major players.

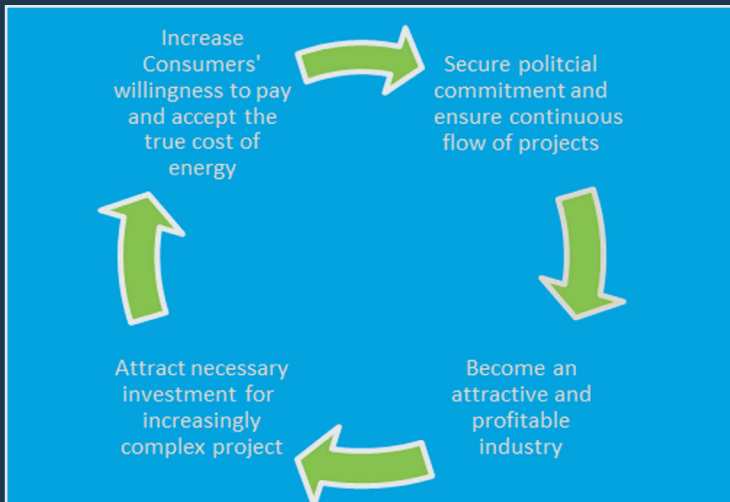


## 4 Be open to new models of financing and investment

The World Energy Council and Oliver Wyman Consulting found in a 2014 joint study that there is enough private capital available to invest in renewable projects. As an attractive industry, innovative financing mechanisms will be developed to respond to the funding needs of more complex projects. Therefore, firms within the industry should continue to explore new ways of raising capital.

Siemens, a wind turbine manufacturer, is already seeing a fundamental shift in the financing schemes of projects. "There is a considerable move from cash payers to institutional investors looking for long-term infrastructure assets." The presence of institutional investors predicts confidence and reliability in an industry, since investments from this group go into projects with

### 5. A development cycle for the wind industry



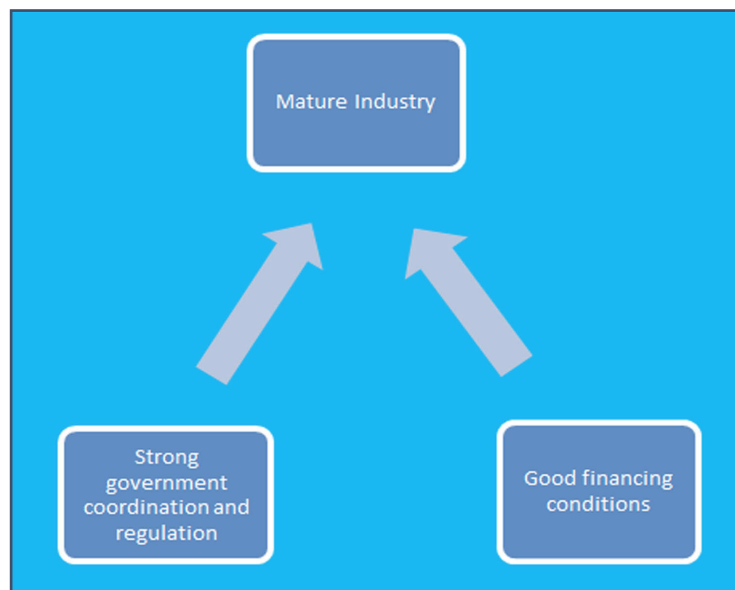
Source: Author's model

## Long-term focus

### A competitive industry beyond subsidies

For an industry that wants to mature, it will have to wean itself off subsidies, develop a strong market base and attract sustained private investment. Strong government coordination and regulation and good financing conditions will be the pillars. Needless to say, not all of these conditions are present even in Europe as much as we want them to be. This is something that the industry must work towards.

### 6. The pillars of the future



Source: Author's model



# Conclusion

## The Value of BCCD's Industry Consultations

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The BCCD Industry consultations engage firms to collectively pool their ideas in order to increase their capacity to innovate and increase their productivity. At these events, companies will use their group capacity to drive their industry agenda using the Chamber's neutral platform that will see them gain privileged access to specialised inputs and human resource, as well as unique information and knowledge. Participating companies will ultimately have an advantage because they will be able to respond rapidly to market needs. Companies will recognise the benefits of information and knowledge flows and notice new technological or market possibilities faster than others.

At the BCCD Industry Consultations, companies can:

- Use BCCD neutral platform to address common industry challenges.
- Use the BCCD exclusive access to regulators and politicians to broaden the channel of communication between your firm and the public sector.
- Influence public policies as a common voice via the BCCD extensive network in Denmark, the UK, the EU Commission and the rest of Europe.

Following each event, BCCD will publish a full White Paper recapping the major themes and include a pitch as to the way forward.



## Appendix A – Perspectives

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### **Regulatory perspective (EU Legal complexity)**

**Dr Alexander Dlouhy, Head of Energy & Utilities, Osborne Clarke**

With one of the goals of climate and energy policy being to achieve a 20% increase in energy efficiency, through power interconnection and involving 3 different countries, legal issues arise in various areas. With regard to ownership laws in different countries and also the regulation of power capacity, it is of interest in both public and civil law. Therefore, harmonisation will be important in order to achieve grid connection, which is in turn necessary for an integrated market.

*The legal complexity that besets the power interconnection between Germany, Denmark and Norway foreshadow what it will take to achieve an EU wide integrated electricity market. Again, as the single market has worked and proven successful so far, there is hope for electricity.*

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### **Regulatory perspective (The UK market-based approach),**

**Robert Hull, Managing Director, UK Office for Gas and Electricity Market (OfGEM)**

It is important to put a long-term solution in place, which provides investment and security. The industry has been transformed in the UK over the course of the last 10 years, as binding energy targets have triggered large investments year after year. OfGEM's role in regulating is to attempt to strike a balance between affordability, investment and security. Although cost is certainly a significant issue, government policy is intended to supply capacity and security to the market whilst effectively changing the energy mix.

*The UK's model for fast tracking renewable into the energy mix is seen by many as the template for the EU single electricity market. At an EU level, there are still concerns about how to switch to a market based approach, while keeping price affordable and supply secure.*

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### **An industry perspective (Cost levelling)**

**Jens Hansen, CEO A2SEA**

When installing offshore wind farms, the first priority is always safety. Large scale farms and larger turbines have an advantage due to the relative speed of installation, coupled with greater quality and efficiency. Mr Hansen emphasised the need for a continuity of projects from politicians and developers in order for the industry to achieve ambitious cost reduction goals.

*Cost efficiency in the industry can only be ensured by leveraging volume. A sustainable array of projects will make a difference on how companies in the value-chain plan their operation and utilise expensive equipment to meet cost reduction targets.*

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### **An industry perspective (Innovation)**

**Frank Zimmermann, Global Sales Director Siemens Wind Power**

With the goal of reducing the cost of energy by 2020 in mind, investment opportunities are good for renewable energy. As a turbine manufacturer, it is certain that there will be massive changes with regard to new turbines, although they might not look very different. The key to future success will lie with a radically new idea which could make the entire industry sustainable. Such innovation would in turn lead to further positive impact in other areas, such as job creation.

*Innovation in turbine design and manufacturing will see greater energy output and higher production efficiency. This will ultimately have knock-on effect on energy prices. However, financing such investment in R&D requires an assurance of ROI, which is still largely dependent on political will.*

# Appendices

## ***An industry perspective (Human resources)***

***Dr Bernd-Georg Spies, Partner, Russel Reynolds Associates***

Having witnessed the development of the wind energy industry from humble beginnings in Hamburg, right up to the present day, Dr Spies is keen to point out that the industry is now maturing and that there needs to be a reliance on excellence rather than subsidies. With this in mind, innovative solutions and skills are needed in order to achieve the ambitious goals that have been set out. There is one area where renewable energy still has a lot of room for improvement - in the academic field and this is important to note.

*Available talents are not matching the industry's demand. Fortunately, skills from other industries can be redeployed within a relatively short period of time. However, this is not a sustainable model for an industry that is on the way to maturing. It needs to cultivate its own base of experts for the future.*

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## ***An industry perspective (Supply chain bottle necks)***

***Joachim Steenstrup, Head of Supply Chain, DONG Energy Wind Power***

DONG Energy is investing significantly in offshore wind and the Danish 2020 target of 6.5 GW is almost as large as Germany's target. With much of the investment taking place in the UK, Mr Steenstrup highlighted the challenges posed by local content requirements. There is a lack of specialised knowledge in the UK supply chain and this presents a challenge. With this in mind, there is a lot to be gained by standardising, as well as pushing suppliers and paying close attention to every aspect of the supply chain. Government may also have a role to play here in order to prevent supply chain bottlenecks.

*The weak supply chain is posing a huge risk to projects' lead-time and profitability. Local content requirement does not make it any better. A fundamental shift in the supply chain has to take place in order to meet the demand of the future.*

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## ***An industry perspective (The future/weaning off subsidies),***

***Sven Utermohlen, Director Offshore Wind, E.ON Climate & Renewables***

The future of offshore wind in the EU energy mix is the central question and offshore wind has a role to play as long as there is demand for more renewable energy in the future. There are challenges ahead and there is reason to be optimistic when noting that costs have come down from 150 Euro per MW hour to 120 now. The target is now fixed to get the cost down to 100 Euro per MW hour, which is achievable. It is also important to note that wind energy has high energy economic quality, which helps to make it a significant part of the energy mix.

*Overall, the offshore industry still has huge potential for the future. It should be able to wean itself off subsidies becoming sustainable.*

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## Appendix B

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# Appendices

## Appendix B

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**The British Chamber of Commerce in Denmark (BCCD)** is a bilateral Chamber for British and Danish business people in Denmark. The vision of the BCCD is to be a prominent promoter of business and culture between Britain and Denmark.

**Contributors:**

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*Dr Alexander Dlouhy, Head of Energy and Utilities, Osborne Clarke*

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## Appendix C– References:

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