



A Vendor's Perspective: Major Impediments to building an Offshore Wind Supply Chain In North America

December 2010
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Global Marine Energy

Global Marine Energy: Who we are



Subsea cable installation expertise

Global Marine Energy : What we do

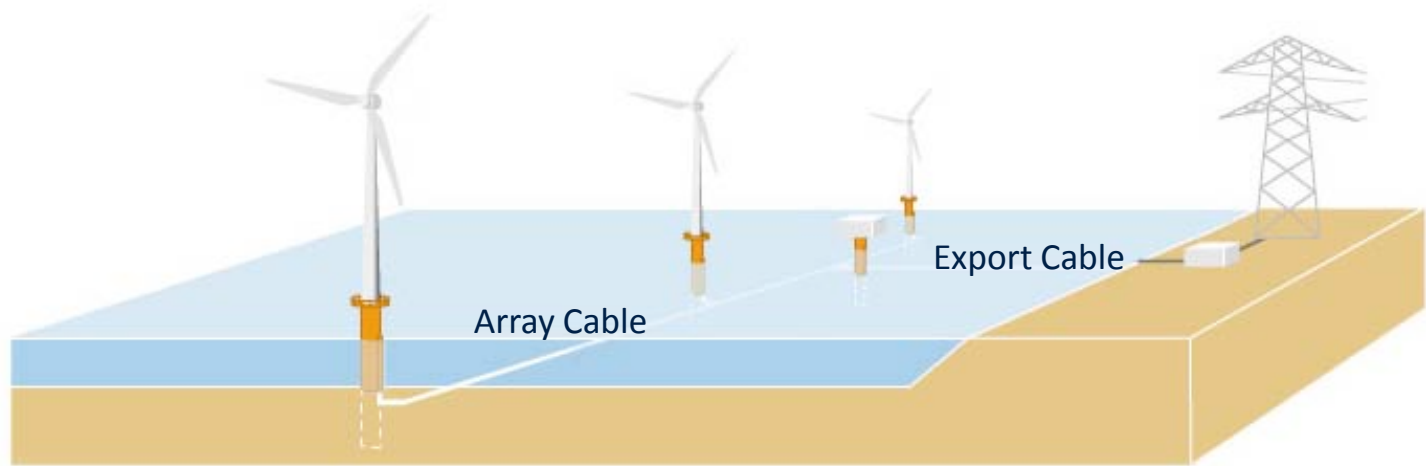


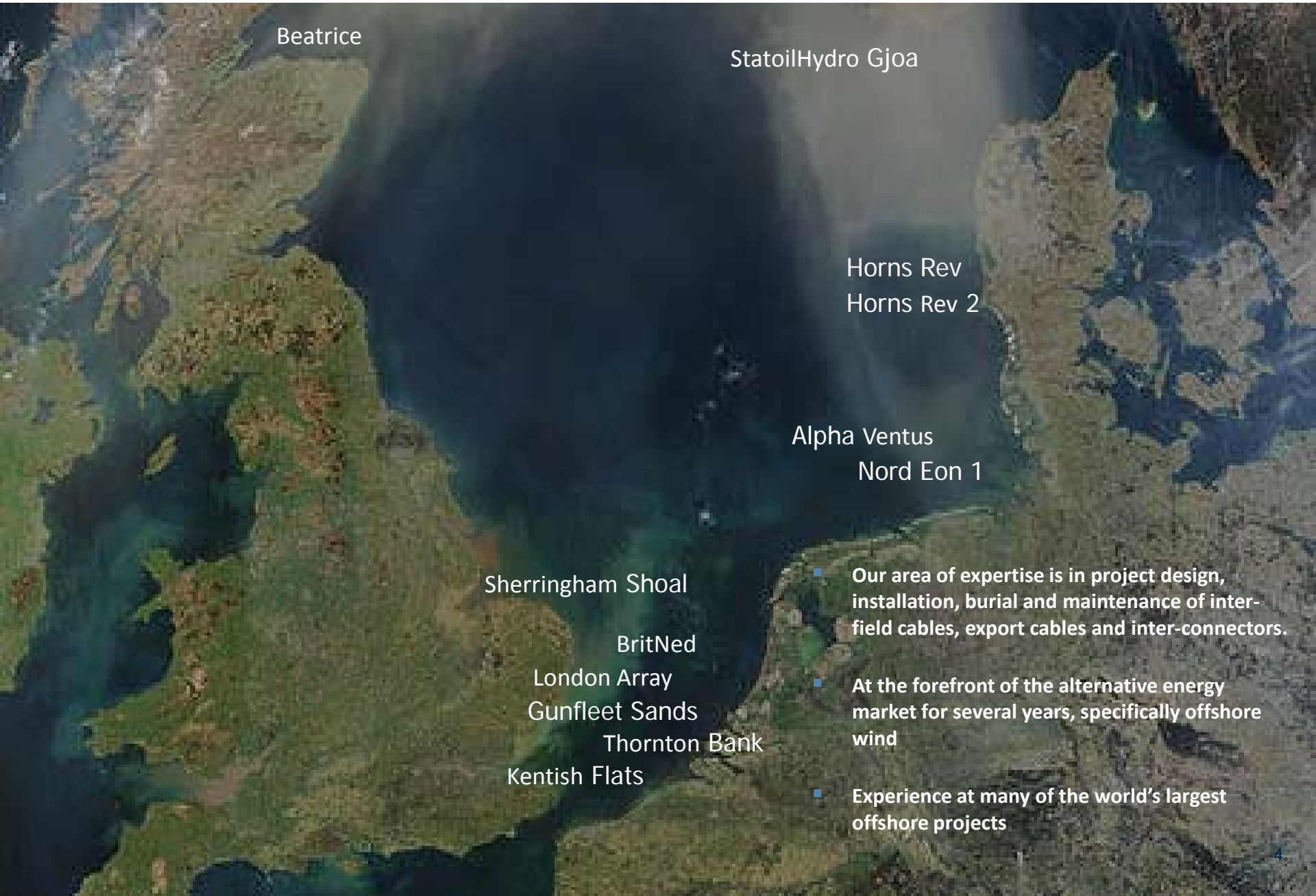
Image source: BWEA



- 150 year old company and European market leader for the installation of cables for offshore wind farms, and point to point grid interconnections
- Our area of expertise is in the project design, installation, burial and eventual maintenance of array cables, export cables and inter-connectors



Global Marine Systems: Subsea Power Cable Installation Specialists



Beatrice

StatoilHydro Gjoa

Horns Rev
Horns Rev 2

Alpha Ventus
Nord Eon 1

Sherringham Shoal

BritNed

London Array

Gunfleet Sands

Thornton Bank

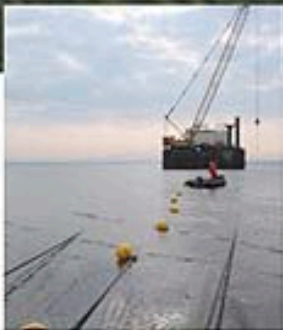
Kentish Flats

- Our area of expertise is in project design, installation, burial and maintenance of inter-field cables, export cables and inter-connectors.

- At the forefront of the alternative energy market for several years, specifically offshore wind

- Experience at many of the world's largest offshore projects

In short, we handle cable: our vessels & equipment are stationed around the world installing cable across industries...



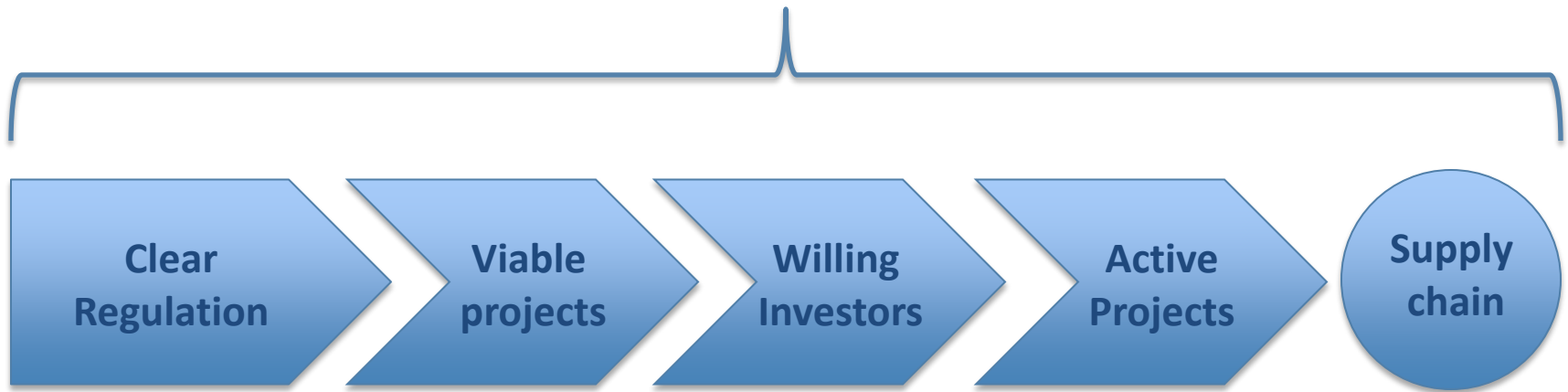
Supply Chains come from Market Confidence



Can this be created in North America?

Where have Offshore Wind supply chains come from?

Government Will



What will it take for Offshore Wind in North America to have market confidence?

Government Will

European Example

European Energy policy is quite different than that of North America in some very specific ways:

1. The Gas & Oil in the North Sea has been largely consumed with the industry in a state of slow decline
2. The domestic alternatives to fuel supply are limited:
 1. Coal plants are being shut down with few if any being permitted
 2. Natural Gas reserves are largely available only from Russia
 3. Nuclear energy is unpopular with most Europeans with the exception of France
 1. Although both England & Germany will most likely be forced into adding to their Nuclear fleet
3. The ideal of Global Warming as a by product of man made activity is an axiom of modern life
 1. Most politicians campaign on this platform regardless of Party
 2. Schoolchildren of all ages are taught this as scientific fact
 3. Tax policy is regularly used to minimize the use of carbon based fuels and incent alternatives



What will it take for Offshore Wind in North America to have market confidence?

Government Will

- 1. As a result, since the mid 1990's the creation of industrial scale alternative energy sources has been a top EU priority**
 - In Each country Alternative energy policy has been built upon the natural resource available to that country. Examples:
 - Scandinavia: Hydroelectric
 - UK: Wind
 - Germany: Wind
 - Denmark: Wind
 - Netherlands: Wind
 - Spain: Solar
 - Portugal Wind & Solar
 - In most European countries local control of zoning is quite strong, as a result ONSHORE wind has had great difficulty in getting permitted and OFFSHORE is seen as the best option by both the politicians and the citizens
- 2. In the UK and Germany in particular OFFSHORE WIND is seen as a major contributor towards:**
 - Future carbon-neutral energy production
 - Security of energy supply through domestic production
 - A potential export market as inter-country transmission grids are being built





The UK and Germany are far and away the largest markets for offshore wind with both countries having set very aggressive goals for themselves as a matter of Government policy.

In the UK specifically the milestone legislation which set these targets are the ***Climate Change Act of 2008***

Climate Change Act 2008

UK legislation which introduces the world's first long-term legally binding framework to tackle the dangers of climate change.

The Climate Change Bill was introduced into Parliament on 14 November 2007 and became law on 26 November 2008.

The Climate Change Act creates a new approach to managing and responding to climate change in the UK, by:

- setting ambitious, legally binding targets
- taking powers to help meet those targets
- strengthening the institutional framework
- enhancing the UK's ability to adapt to the impact of climate change
- establishing clear and regular accountability to the UK Parliament and to the devolved legislatures.

The full text of the Act can be found here:

<http://www.statutelaw.gov.uk/legResults.aspx?LegType=All+Legislation&title=climate+change&Year=2008&searchEnacted=0&extentMatchOnly=0&confersPower=0&blanketAmendment=0&TYPE=QS&NavFrom=0&activeTextDocId=3539938&PageNumber=1&SortAlpha=0>

Infrastructure Planning Acceleration Act

The Federal Government is aiming to increase the proportion of power generated from renewable energies to at least 12.5 % by 2010 (double the level of the year 2000) and to at least 20 % by 2020. The German Environment Ministry is rather more optimistic, and believes that a level of 25 % is achievable. It is envisaged that renewable energies will account for at least 10 % of primary energy consumption by the year 2020, and at least 50 % by 2050.

In future, the contribution made by wind power is expected to rise continuously, primarily thanks to the use of offshore wind power. By 2030, the proportion of electricity generation from wind power is to be increased from its current level of around 5 % to at least 25 % (onshore: 10 %, offshore: 15 %). An installed offshore output of between 20,000 and 25,000 MW is possible by the year 2030. The potential annual electricity yield from offshore wind farms is estimated at 85 to 100 TWh, accounting for approximately 15 % of Germany's electricity consumption in the reference year 1998. Whereas to date, there have only been a few isolated offshore plants situated in the immediate vicinity of the coast, from 2008/9 the first wind farms are due to be built in the North and Baltic Seas.

*The entry into force of the **Infrastructure Planning Acceleration Act** obligated grid operators to ensure grid connection for all offshore plants for which construction has commenced prior to 31 December 2011. By that date, offshore wind farms with an output of around 1,500 MW could be installed, and production capacity should have expanded sufficiently to enable high levels of regular annual growth from 2011 onwards.*

By the end of 2020, conservative forecasts predict an installed offshore output of between 7,000 and 10,000 MW, while cautiously optimistic scenarios predict an installed output of up to 12,000 MW.

The German Government is also abiding by its long-term target of up to 25,000 MW by 2030.

[A good overview of the Infrastructure Planning Act from the German Energy Agency can be found here](#)

http://www.dena.de/fileadmin/user_upload/Download/Dokumente/Publikationen/ESD/02_eng_Offshore_networks.pdf

What will it take for Offshore Wind in North America to have a clear market?

Government Will: Current Situation in North America

Lets Think Like Investors for a Moment...

Where is the Government leadership coming from?

- Federal Government?
- State Government?
- Provincial Government?

What is the motivation?

- Environmental Concerns?
- Green Jobs?
- A new approach to energy policy?

Who is against this market?

- What is the real threat presented by alternative energy?
- What do they have to lose?
- To what lengths will opponents go to stop it?

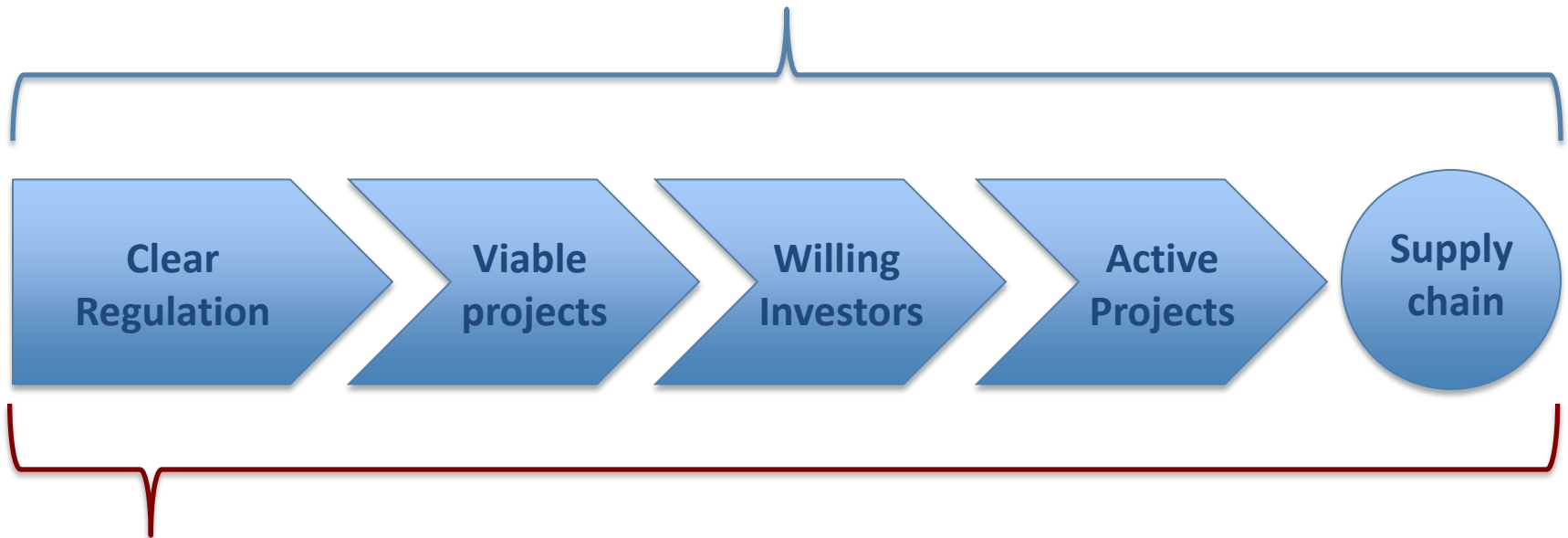
Factoring for the above:

- What will my **Return** be?
- What will my **Risk** be?



Where will supply chain constraints show up?

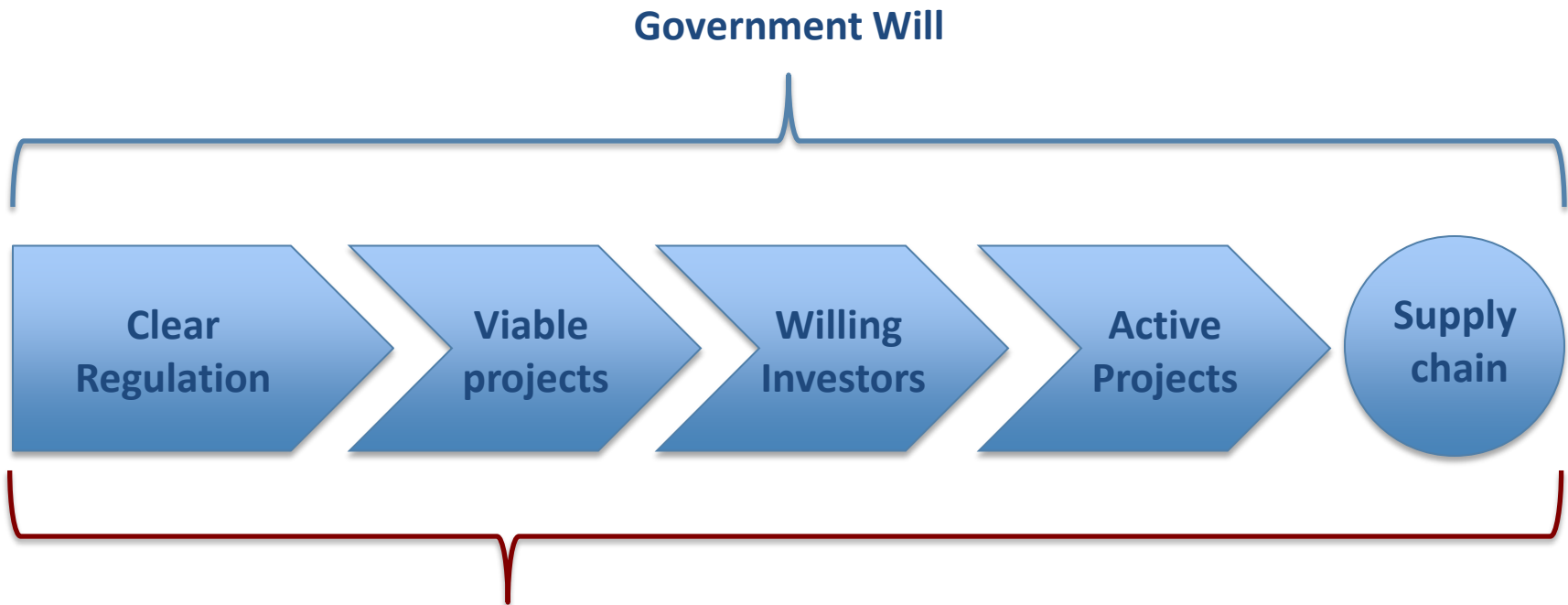
Government Will



The industry needs a clear and comprehensive Regulatory environment upon which projects can be designed

Without these projects are often at the mercy of vague timescales and approvals, unhealthy competitive behaviors and shifts in political priorities

Where will supply chain constraints show up?

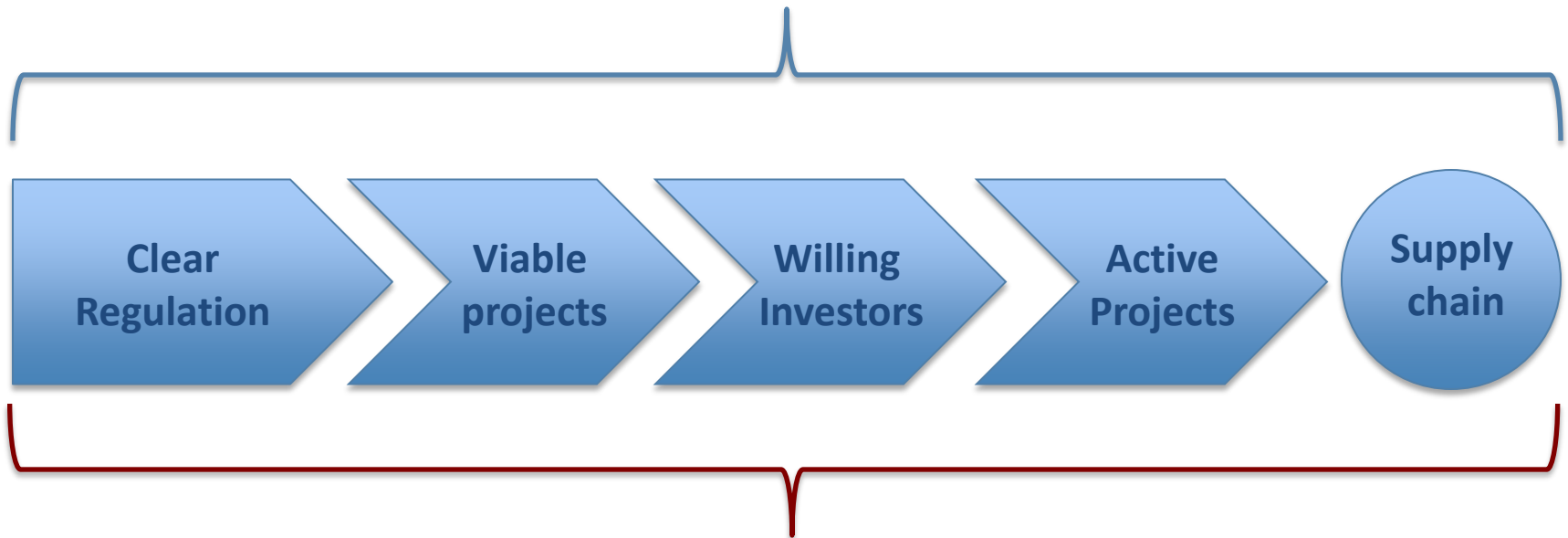


Projects must be able to market themselves as being able to be constructed and operate within Government, Financial & Industry parameters

As many of these parameters are new and untested, the margin for error and delay must be regarded as significant

Where will supply chain constraints show up?

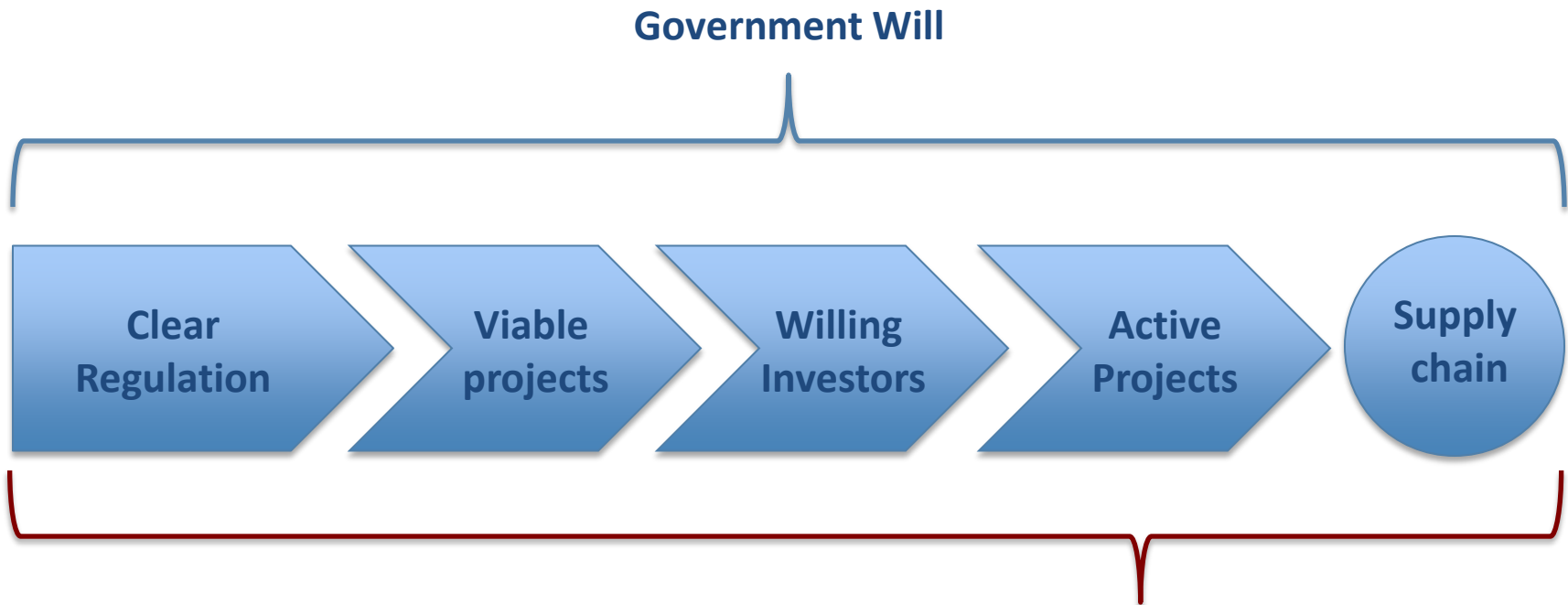
Government Will



Willing investors will be found when it is clear that the projects will go forward, in a stable business environment, despite ongoing opposition

Prior to that, despite potential returns, the amount of risk required to take for any type of meaningful investment must be well considered

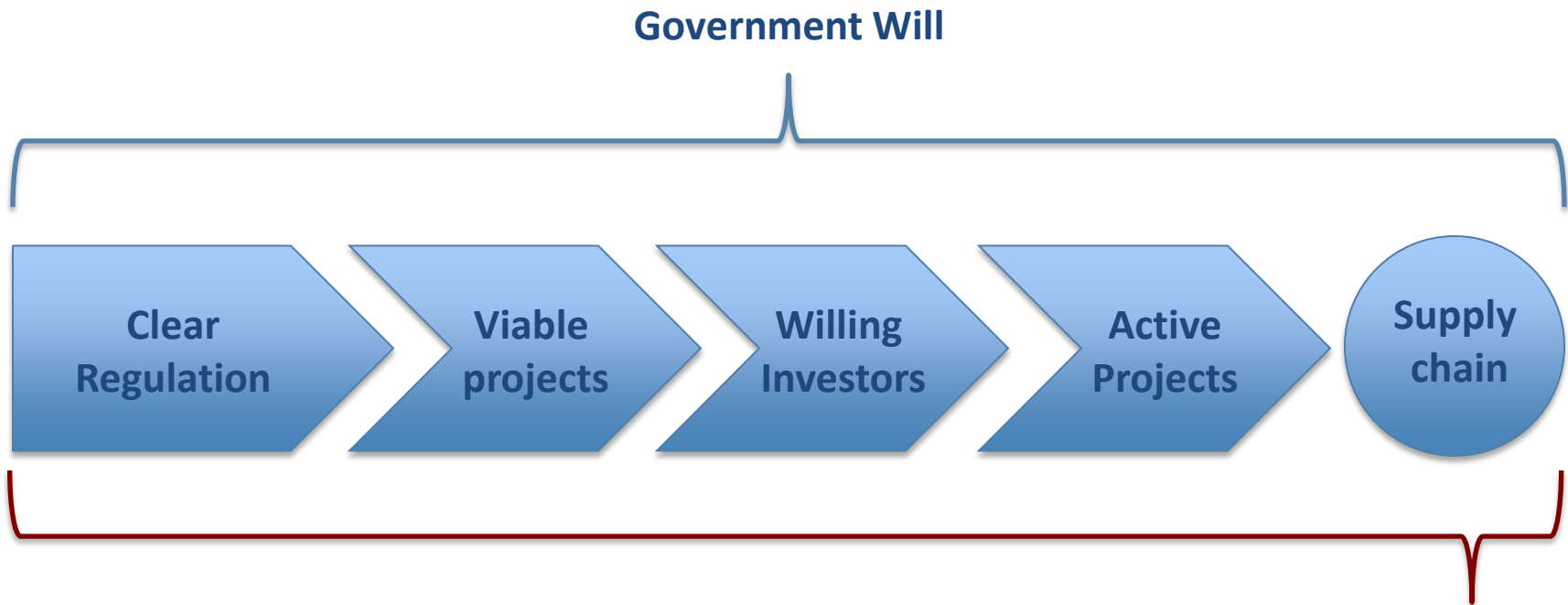
Where will supply chain constraints show up?



Large numbers of active projects can only occur when investors are enthusiastic about their potential returns

Before that one-off proof of concept projects will fight the status quo every step of the way to pioneer the foundations of the industry

Where will supply chain constraints show up?



A healthy domestic supply chain will only emerge when there are enough permitted projects to ensure returns on long-term investment

Before that supply chains will be based on costly imports of purpose built equipment and experienced know-how

The Sober News is...

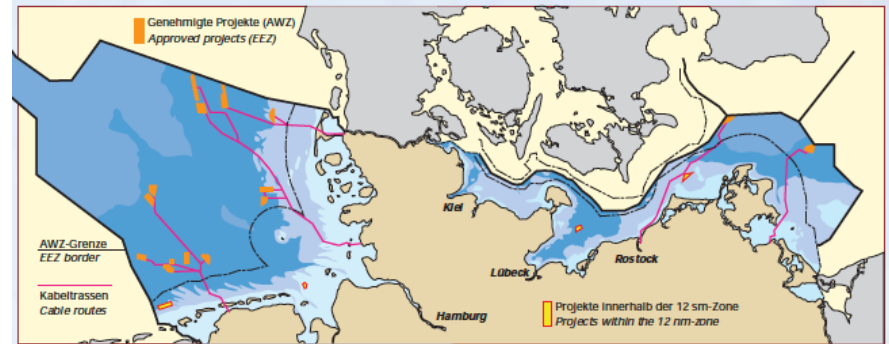
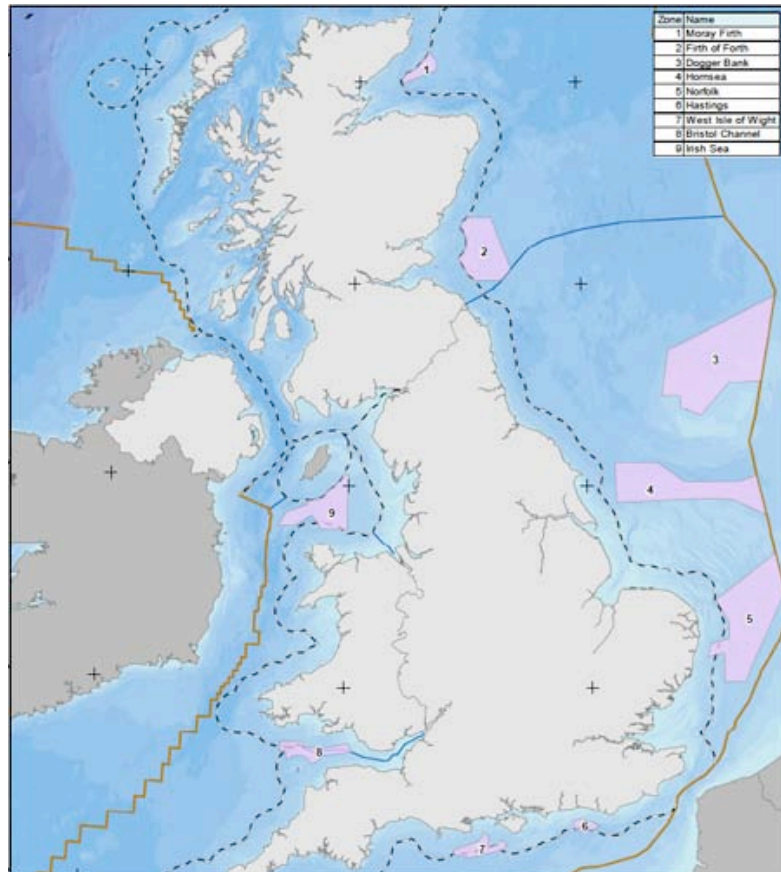
All of these upstream battles need to be worked through before we can honestly talk through what we really want to be talking about:

Things like:

- Port Facilities
- Turbine design, Manufacture and Supply
- Foundation Manufacture
- Vessel construction and reconditioning
- Cable Manufacturing
- Project Design and Installation
- Training and Certification
- **High Quality Engineering, Manufacturing, and Marine jobs**



The Good News is... this has all been worked out & is being done today...



BY 2020...

UK Target is 33 GW of offshore wind energy

German target is 10 Gw of offshore wind energy

"The offshore wind industry is at the heart of the U.K. economy's shift to low carbon and could be worth GBP 75 billion and support up to 70,000 jobs by 2020"

- Government Statement



Thank You

