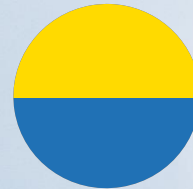
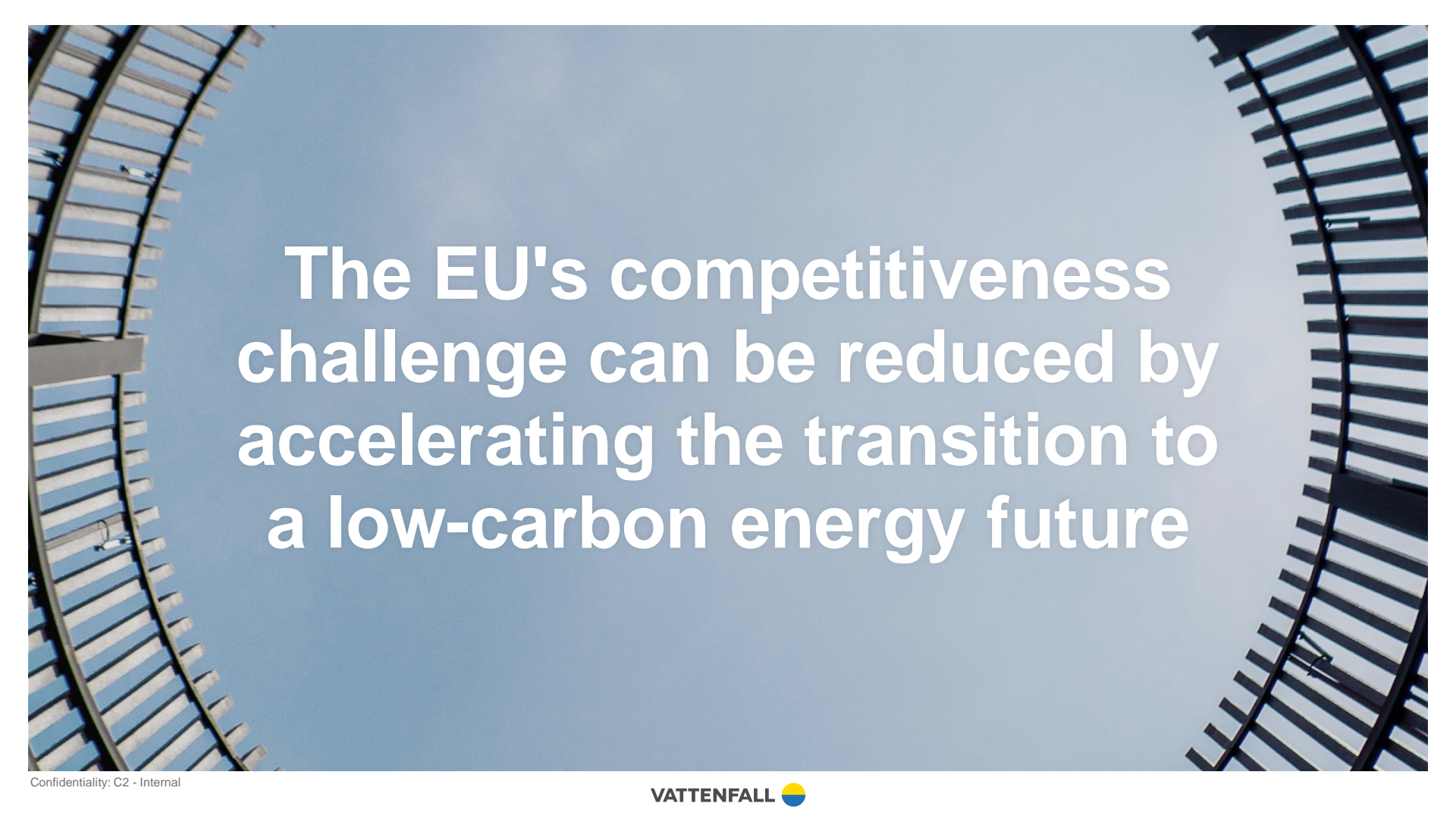




VATTENFALL



Working for fossil freedom



**The EU's competitiveness
challenge can be reduced by
accelerating the transition to
a low-carbon energy future**



**Europe is likely to
have a better competitive
position in a green electricity-
based future, than in the
current fossil paradigm**



Gas likely to stay 3-5 times more expensive in EU compared to the US* – electricity prices will stay higher until gas power is phased out

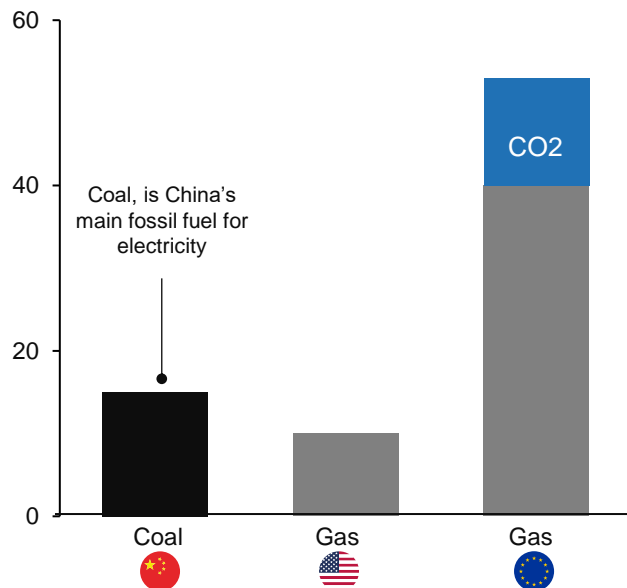
*Including CO2 cost

Electrification is an opportunity

Electricity price-setting fossil fuels will stay more expensive in the EU compared to China and the US

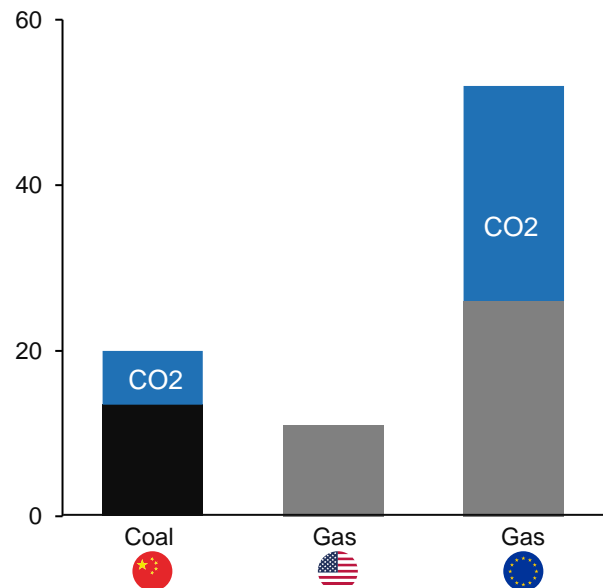
Fossil fuel costs in 2024¹

(Euro/MWh, wholesale price)



Projected fossil fuel costs in 2030¹

(Euro/MWh, wholesale price)



1. Vattenfall analysis, based on Bloomberg New Energy Outlook 2024

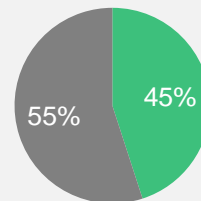
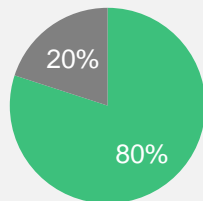
Electrification is an opportunity

EU reliance on gas power plants means it is likely to continue to set electricity prices for most hours in 2030²

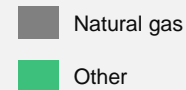
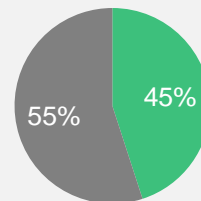
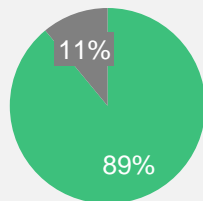
Generation by technology
(% of generation, EU average)

Price setting technology
(% of hours, EU average)

2022











2030
(projected)

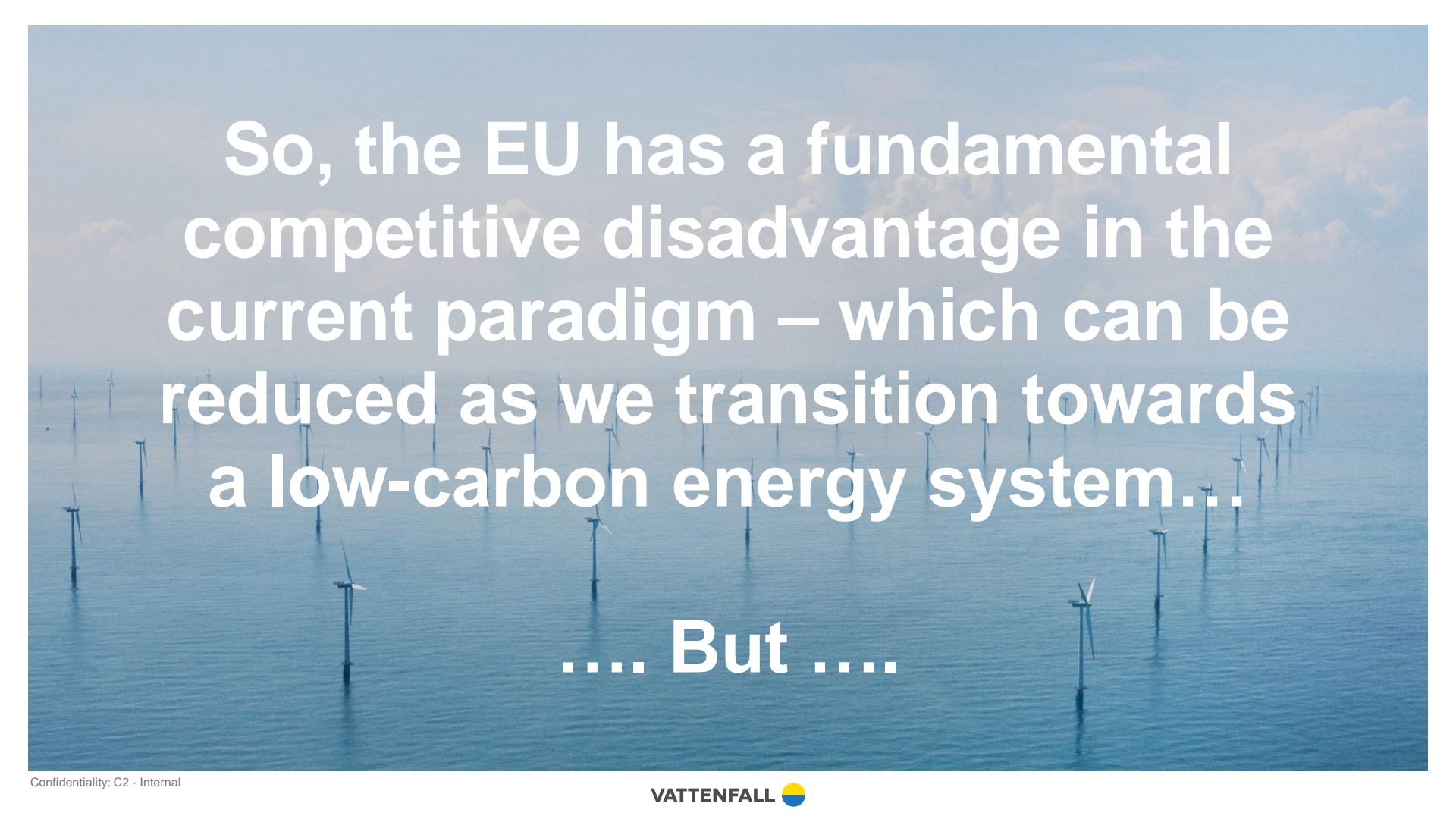


2. JRC Report: "The Merit Order and Price-Setting Dynamics in European Electricity Markets"

Electrification is an opportunity

Europe is likely to have a better competitive position in a green future, than in the current fossil paradigm

	Today	Transition scenarios		Future
	Fossil paradigm	EU leads the way	EU falling behind	Green paradigm
 EU heavy industry	Fossil	Green	Fossil	Green
 Global industry (competing with EU)	Fossil	Fossil	Green	Green
 Keys to industry competitiveness (in each paradigm)	 Low cost of fossil fuels ↓	 High cost of CO ₂ + green subsidies 	 Low cost of fossil fuels + fossil subsidies ↓	 Low cost of green electricity ↓

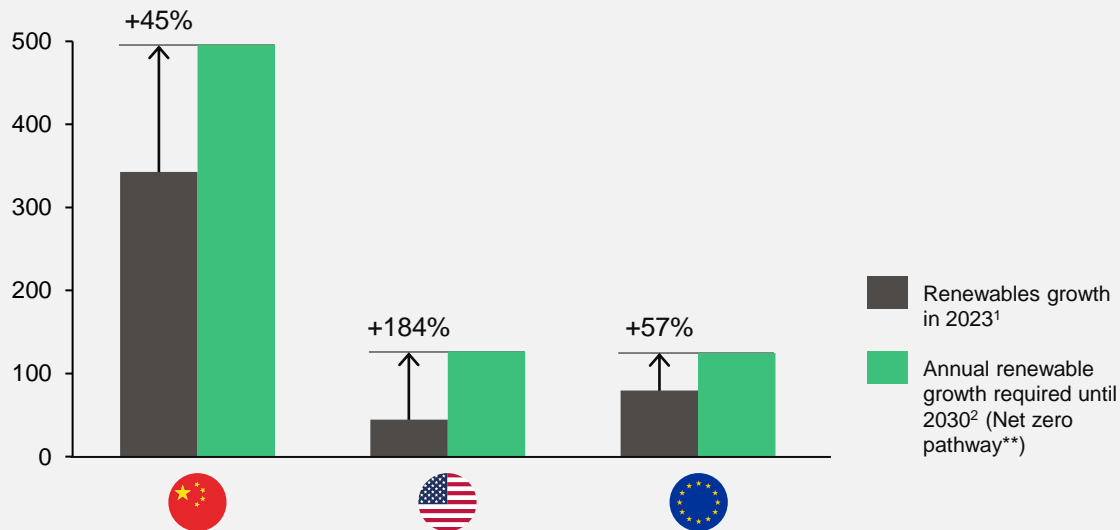


So, the EU has a fundamental competitive disadvantage in the current paradigm – which can be reduced as we transition towards a low-carbon energy system...

.... But

...There is a risk that other regions overtake Europe and go faster to an electrified net zero economy

New renewables capacity added in 2023 vs pace required to stay on net zero 2050 pathway²
(GW)




China's renewable buildout is closer to a net zero pathway than either the EU or the US

2. Bloomberg New Energy Outlook, average 2024-2030 capacity additions required in Net Zero by 2050 scenario



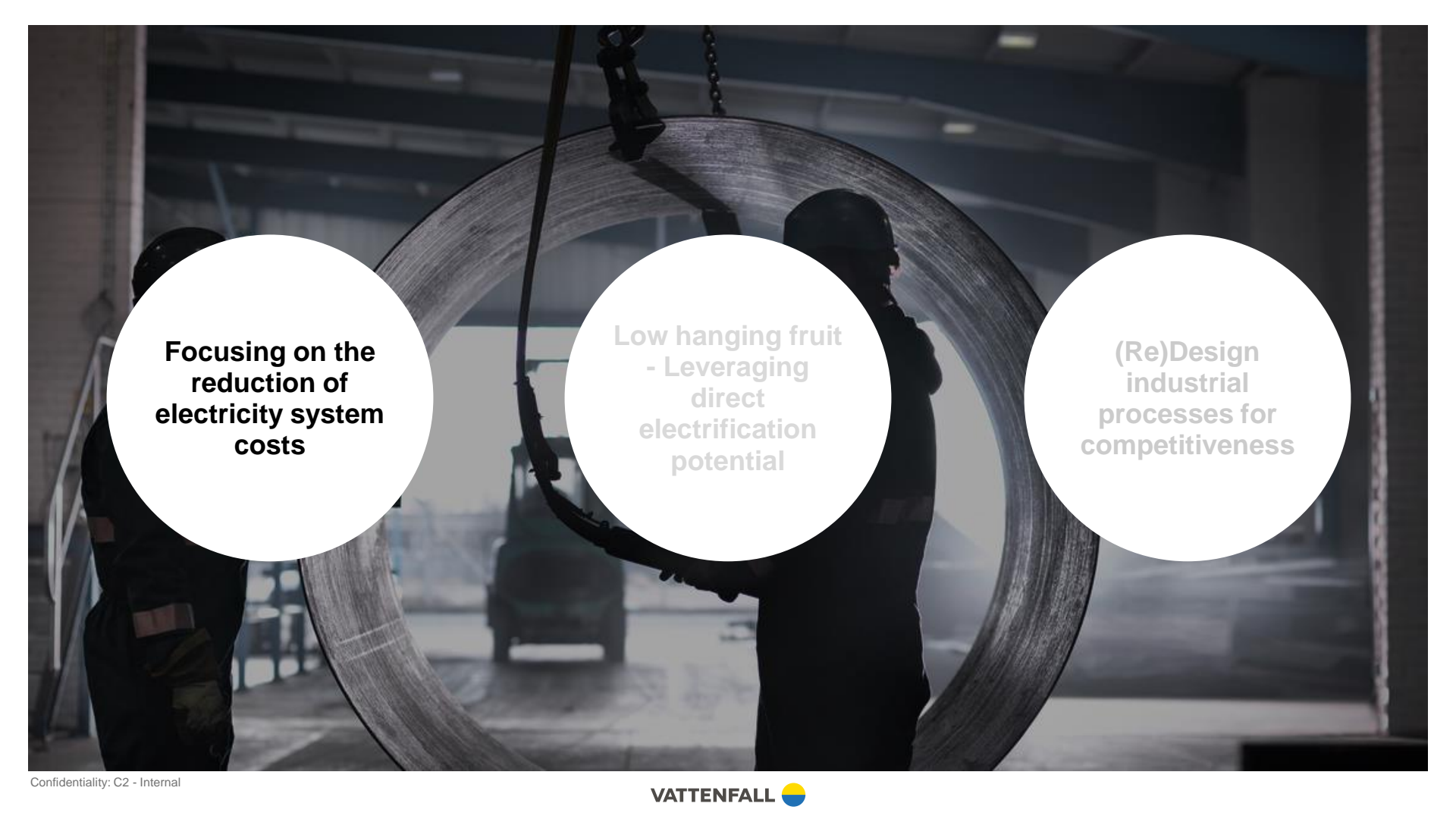
**Reaching a competitive green
future will require a consolidated
effort by the European Union**



**Focusing on
the reduction of
electricity system
costs**

**Low hanging fruit
- Leveraging
direct
electrification
potential**

**(Re)Design
industrial
processes for
competitiveness**

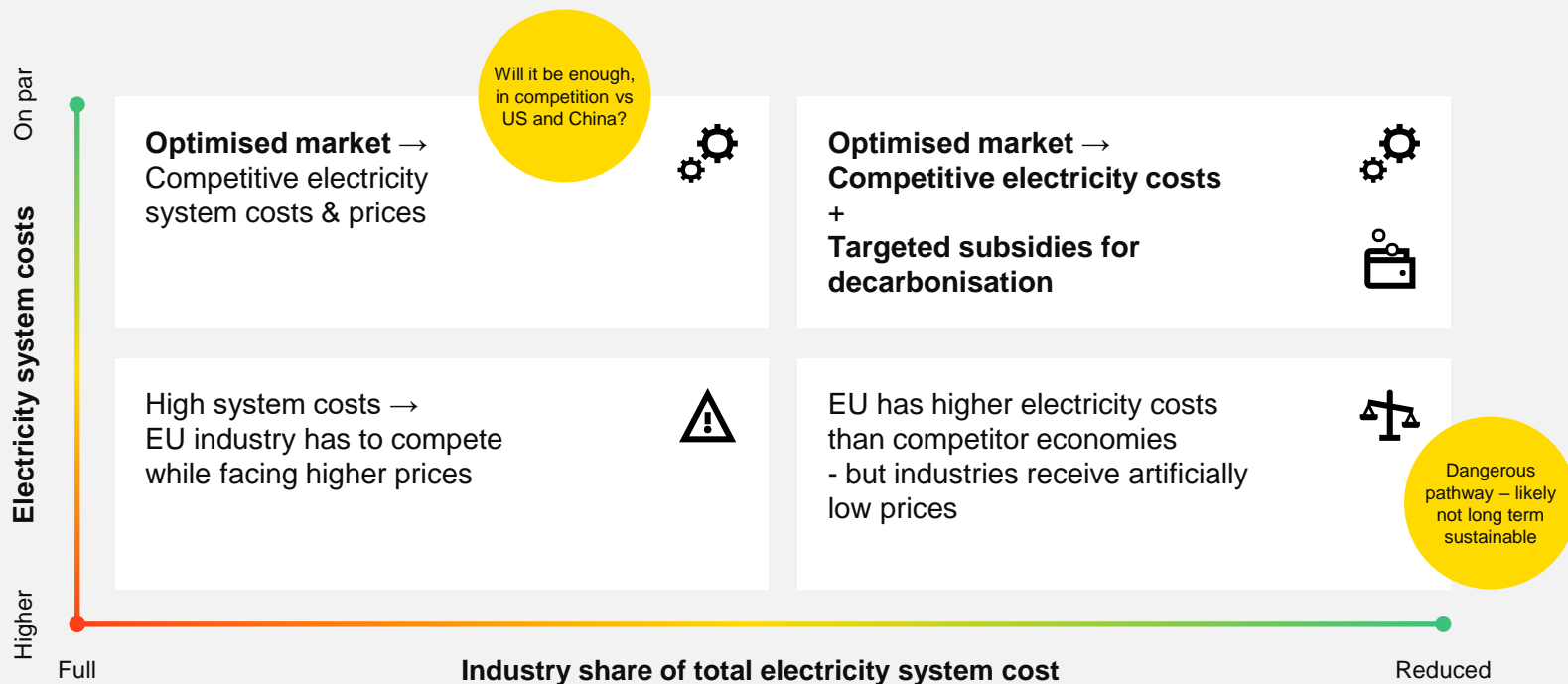
The background image shows an industrial setting. Two workers in dark clothing and hard hats are visible, one on the left and one on the right, both looking towards a large, circular metal component that is suspended by a chain. The component has a rough, textured surface. The scene is dimly lit, with some light coming from the background, creating a silhouette effect on the workers and the component.


**Focusing on the
reduction of
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**(Re)Design
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To reduce electricity price for industry there are two levers: Reducing system cost and reducing cost share for industry



A photograph of a coastal landscape with several wind turbines. The turbines are white with three blades each, and they are situated on a flat, sandy area that appears to be a beach or a coastal plain. The sky is overcast and grey. The water is calm and reflects the light. The text is overlaid on the image in a large, white, sans-serif font.

To minimise system costs in Europe, a massive buildout of wind, and networks, and.... is required, at a competitive cost vs other regions

We have to find ways of creating scale and low cost in Europe – or find sustainable ways to leverage Chinese cost levels – or both...

Technologies where the EU does not currently have a large-scale industry

Solar PV



The EU PV industry produces <3% of panels globally, having been mostly outcompeted by China in the 2010s

Batteries



The battery industry has also struggled to scale up in the EU

Technologies where the EU has an industry capable of large-scale production – but is not cost competitive with China – yet...

Wind turbines



Electrolysers



Nuclear power



Power technology and grids



Technology price level in China compared to the EU (illustrative)

30-40%

25-35%

40-50%

40-50%

What can European companies learn from China in reducing the costs of key electricity technologies?

Wind - Making EU wind power competitive with US and China will depend on turbine costs, investment risk, and cost of land




Bring down wind turbine costs via scale & competition



Reduce investment risk and capital costs for wind




Free up as much land as possible for onshore

The background image shows an industrial setting. Two workers in dark clothing and hard hats are visible, one on the left and one on the right, both looking towards a large, circular metal component that is being hoisted or lowered by a chain. The component has a rough, textured surface. The scene is dimly lit, with some light coming from the background, creating a silhouette effect on the workers.

**Focusing on the
reduction of
electricity system
costs**

**Low hanging fruit
- Leveraging
direct
electrification
potential**

**(Re-)Design
industrial
processes for
competitiveness**

The background image shows an industrial setting with two workers in dark clothing and hard hats. They are positioned on either side of a large, thick, circular metal ring that is suspended by a chain. The workers appear to be inspecting or working on the ring. The scene is dimly lit, with some light coming from the background, creating a silhouette effect on the workers and the ring.

Focusing on the
reduction of
electricity system
costs

Low hanging fruit
- Leveraging
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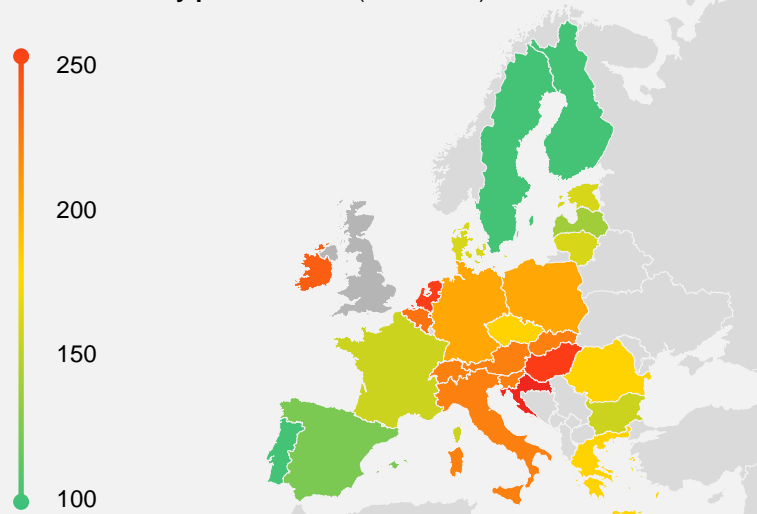
**(Re)-Design
industrial
processes for
competitiveness**

Re-thinking industrial processes

Breaking out the electricity intense process steps can be option to make the total value chains competitive

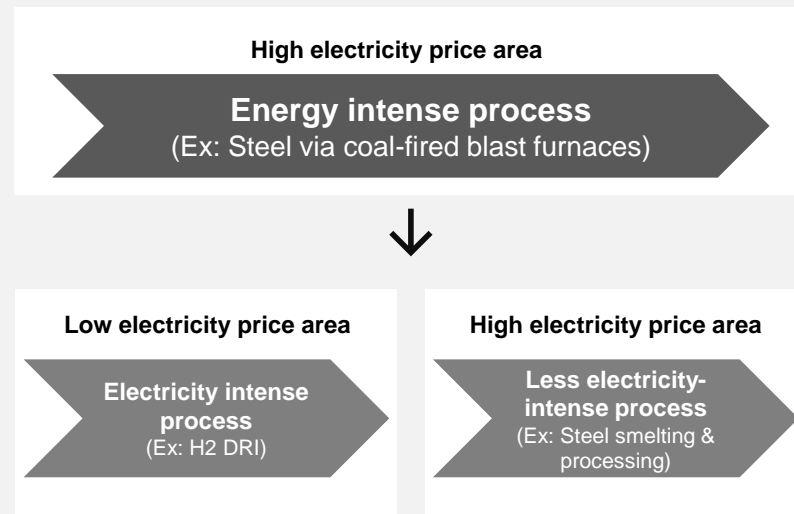
Electricity-intensive processes might struggle to be competitive in high-price areas of the EU

Retail electricity price in 2023¹ (Euro/MWh)



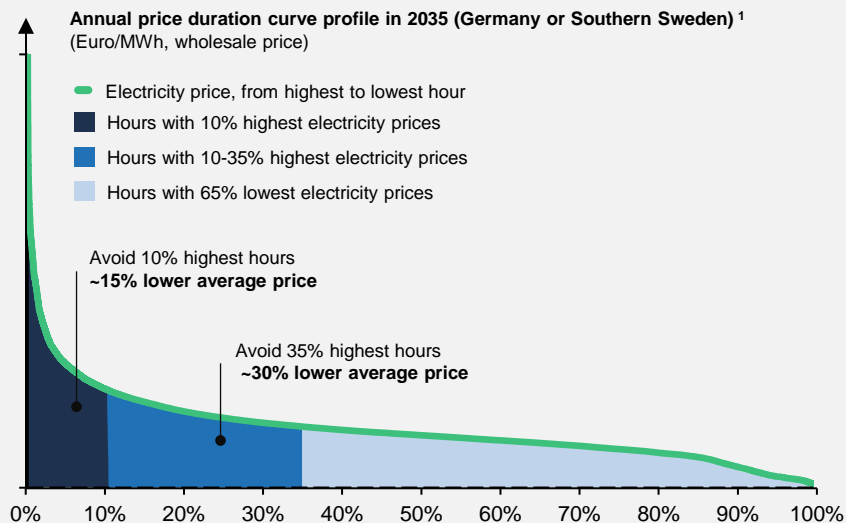
1. Vattenfall analysis, based on Draghi report & [Bruegel Electricity tariffs dashboard](#)

Splitting up value chains can be tool to reduce costs as industry electrifies – keeping/creating jobs



Designing new industrial processes to allow for significant flexibility key driver of cost of electricity

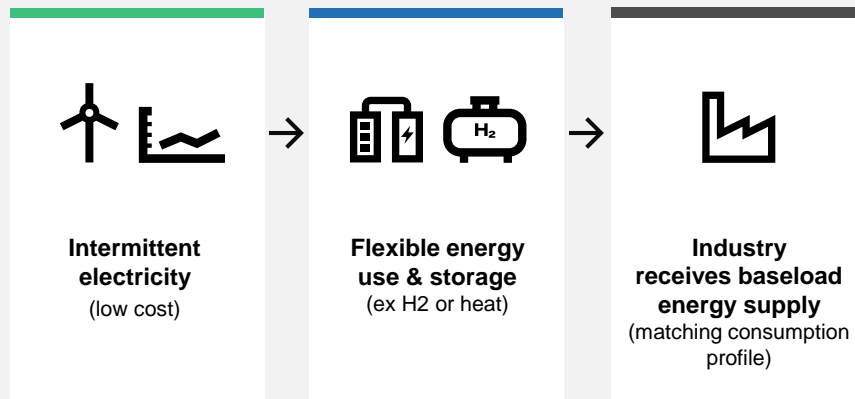
Flexible electricity consumption during ~ 30% of the year can reduce captured electricity prices by ~ 30%



1. Vattenfall analysis

Confidentiality: C2 - Internal

Electricity can be consumed flexibly – with storage to deliver baseload energy through hydrogen or heat



Building energy storage connected to industry demand will reduce the need for expensive balancing/peaking power

- Resulting in lower total electricity system costs

So what for Europe?

Staying in fossil world not an option, for competitiveness or climate reasons

Reaching cost competitiveness in the fossil free world is an urgent must win battle....

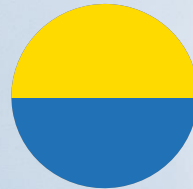
- Where China is likely to play a role

.... meaning that waiting mode is not a good idea

What can we as individuals in this room do to get things going (again)?



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