Supply Chain

Floating Offshore Wind

A Sustainable Developer's View

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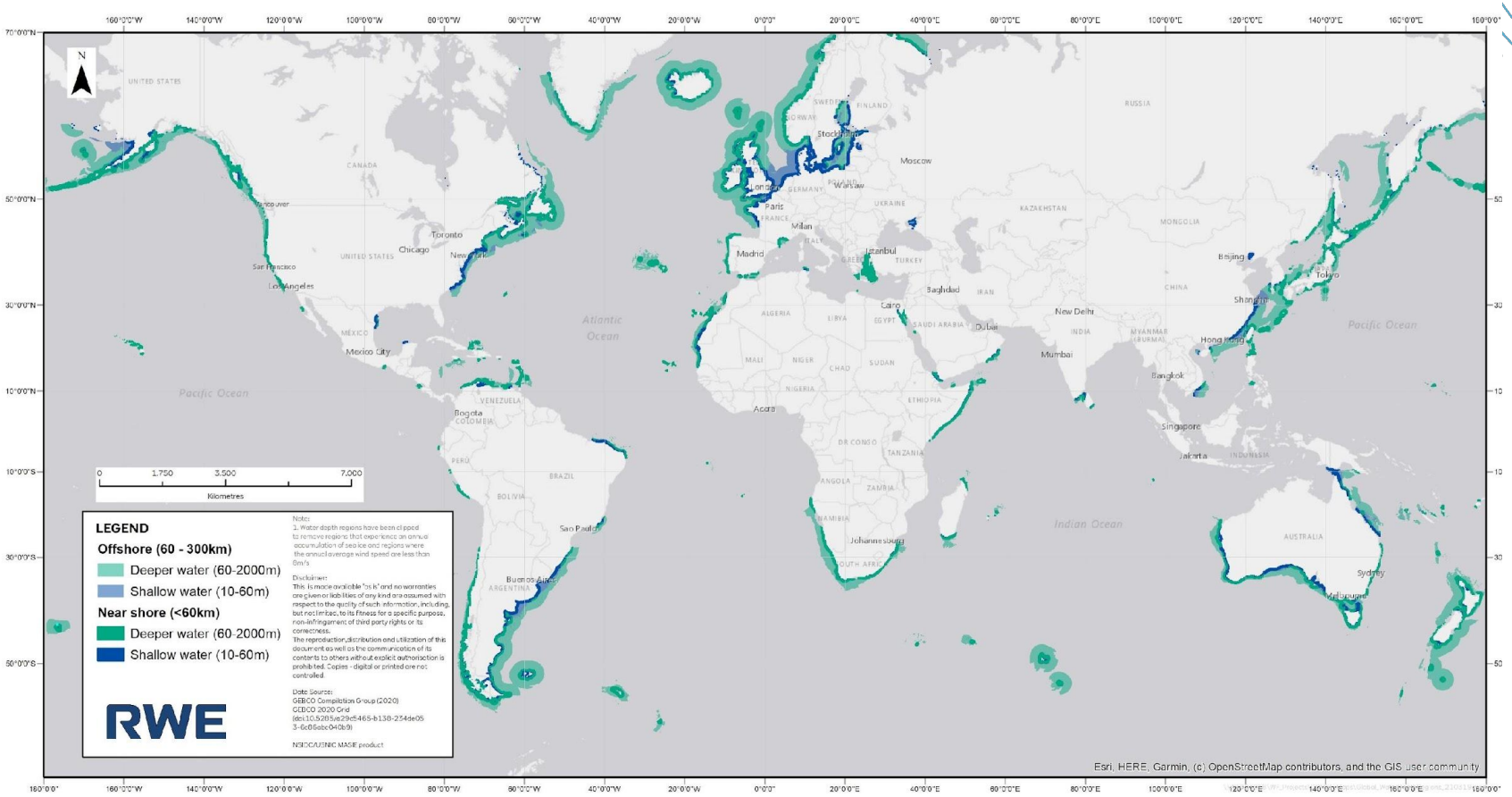
RWE Overview of Offshore Wind

Global Growth and Floating Ambition

- RWE is **aggressively targeting** floating wind project opportunities around the world.
- Currently, we are working on **23 projects** across **9 countries** with a total potential capacity of **>20GW**.
- These projects are at various stages of development, but we do expect to compete in at least **6 competitive floating wind processes** in the next **24 months**
- We are seeing strong **cross-portfolio benefits** from working across multiple markets



The Project Life Cycle and our phase approach
according to our project management framework

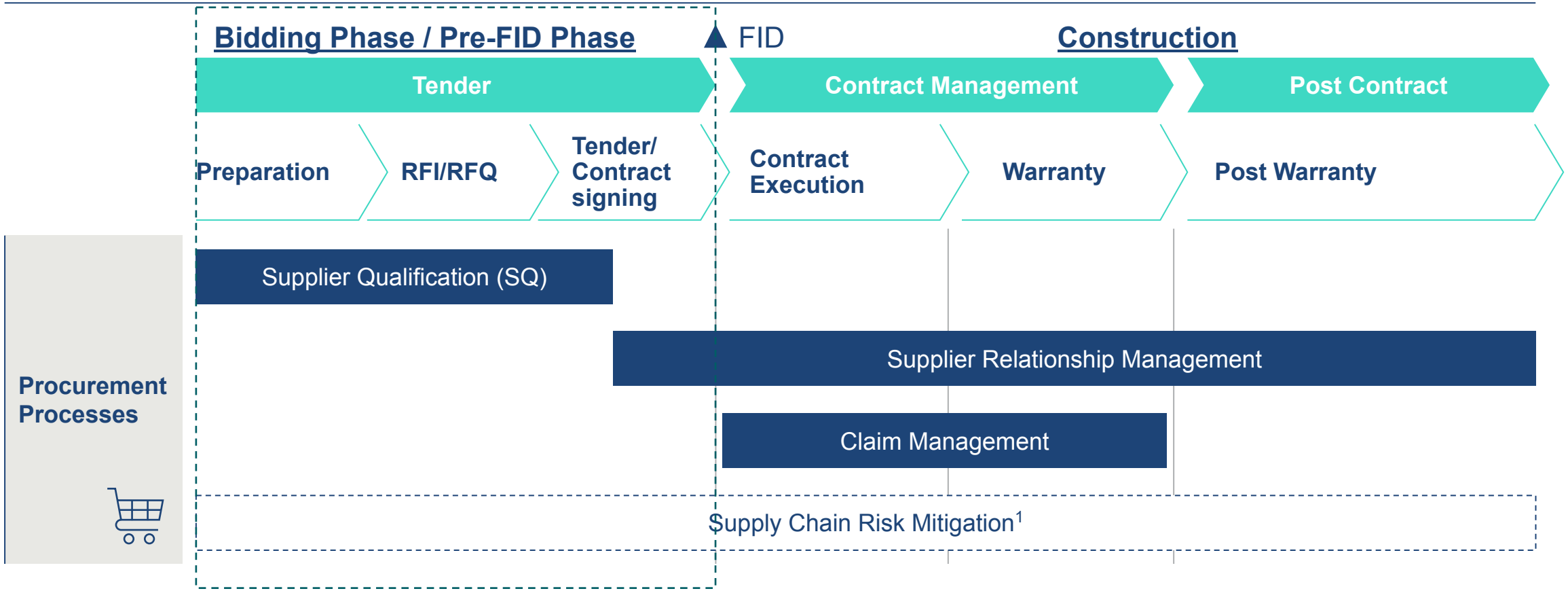
Origination	Development			Construction	Operation
Business / Early Stage Development Phase	Early-stage Development Phase	Offtake Bidding Phase	Pre-FID Phase	Construction Phase	Commercial Operations Phase

Milestones

1. Sea-bed Rights Secured Project Start
2. Initial Budget Approval
3. Off-take secured
4. Financial Investment Decision (FID)
5. Commercial Operations Date (COD)
6. End of operations

Supply chain Initial Steps
Process View

The process starts with the initiation of the tender phase and it needs to be completed before contract signing



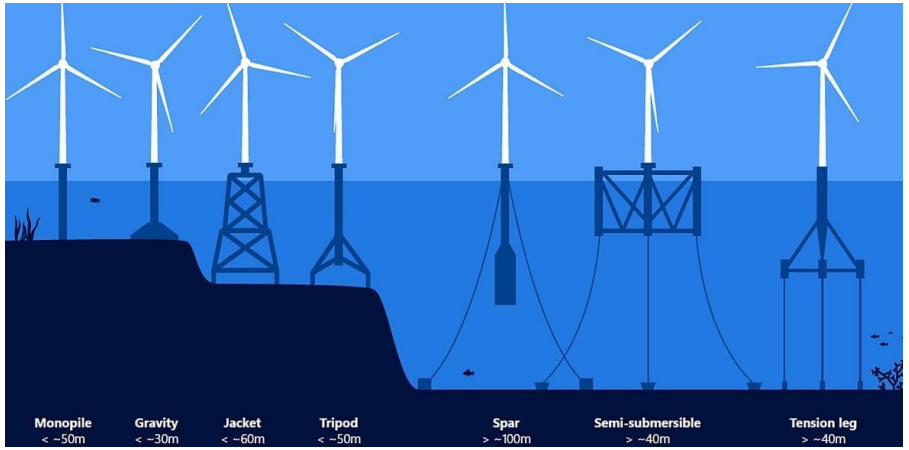
Early-stage Development | Bidding Phase | Pre-FID Phase

Outlook – Challenges to Delivery

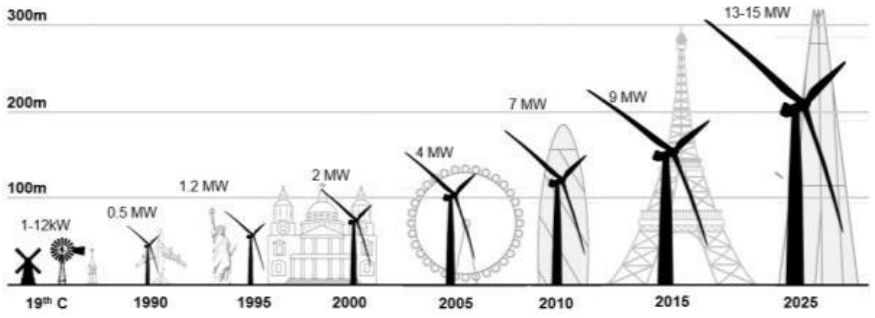
Supply Chain con-strai nts

Global delivery

More complex sites

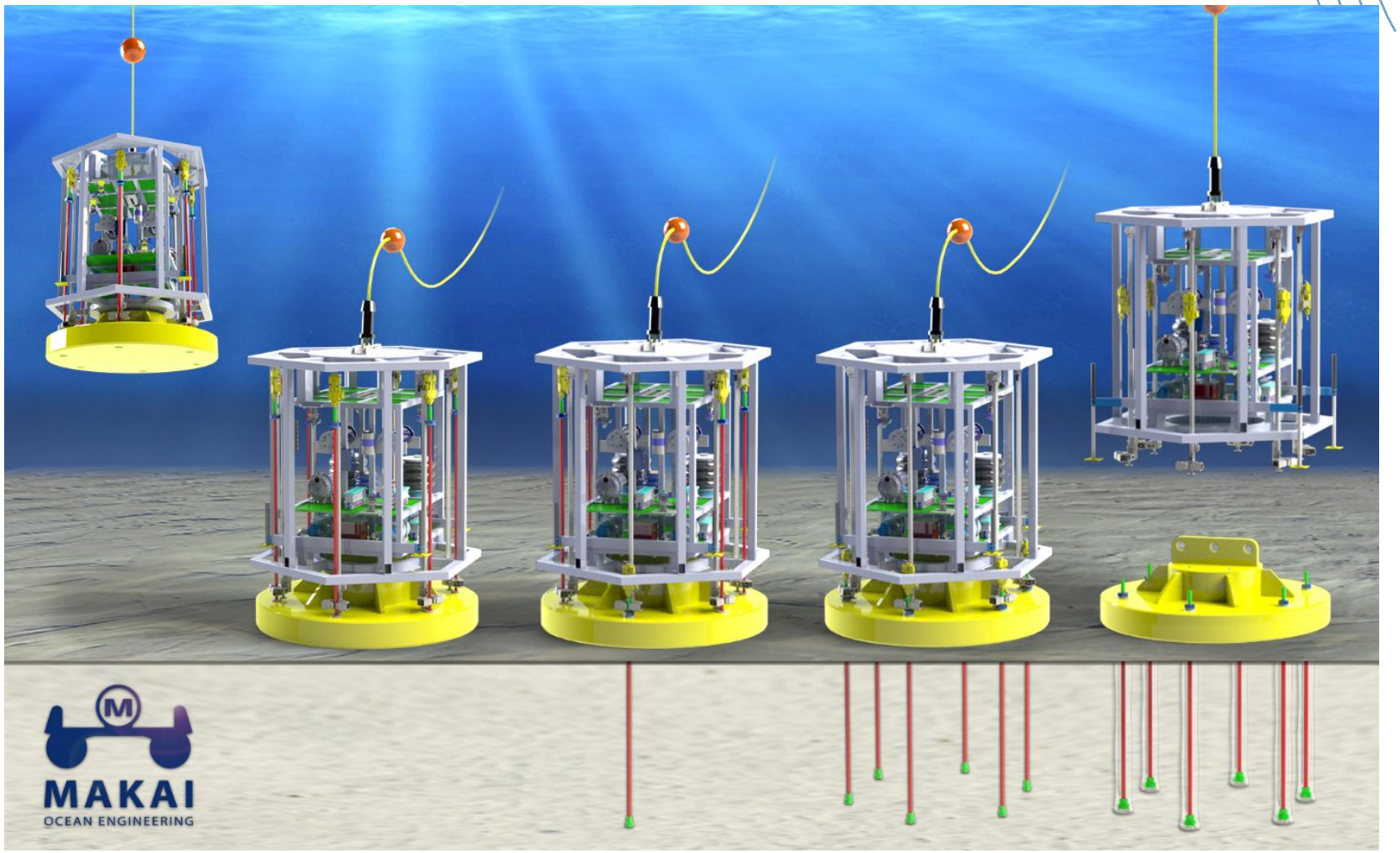


Size & scale of com-pon ents



Technology Innovation

Innovation…Micro pile anchor systems



Source: Courtesy of Makai Ocean Engineering

Green fuel service operation vessels (SOVs)

RWE & Acta Marina commit to decarbonize operations

Why?

In comparison to **conventional vessels,** the new SOVs:

- Have the potential to **save** up to **10,000 tons of CO_2 per year**
- **Reduce** motions and **noise**
- **Expand** the **service capabilities**, setting a new industry standard
- Increase **safety** for technicians

How?

Two **dual fuel vessels** (SX216), powered by **methanol** and **batteries**, will be used for **service operations** and **maintenance**

Other?

Green Steel

Recyclable Blades

Construction to begin in **Q2 2023** and **operational** by early **2025**

The Project Life Cycle and our phase approach
And implications of market dynamics

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New Challenges Compared with Fixed
New Opportunities

Technical

- Novel technology, lack of **standardisation**
- More **onshore** activity, more **infrastructure** required
- New manufacturing and installation methods - **throughput**
- Deeper water further from shore
- Metocean conditions
- New capabilities, **skills and jobs**
- **Size & Scale**

Commercial

- Complex interfaces; **Multiport**
- Cost uncertainty, lack of reference points for valuation
- LCOE vs. **local content**
- **Lead times** and availability of equipment
- Balance of reliability / risk / cost
- Maximizing insurance cover
- Bankability, Investor landscape

Sustainability

- **Minimising negative impact** to environment (throughout project lifecycle)
- **Reducing Carbon emissions**
- Improving security of **local**/regional **jobs**
- **Recyclability** and reuse of structures

In OSW, former buyer's market turned into a seller's market

Buyer's Market

- Suppliers have set prices that did not allow for "healthy" margins
- Overcapacity in the market (no investment into capacity expansion)

Supply chain challenges

High volatility and cost increases

- Macroeconomic dynamics
- Geopolitical challenges
- Disruption of logistics
- Growing RES business
- Technological developments
- Sustainability focus

Seller's Market

- Many suppliers still make losses and are hesitant to ramp-up production
- Shortage of supply and significant price increases

Our core beliefs to mitigate OSW supply chain challenges

1. From project-by-project tendering approach to more **strategic partnerships** – necessary in key categories to secure components for RWE Renewables' growth targets

2. From concentrated supplier portfolio to a more **diversified supplier portfolio** (e.g., increase of competition for cables)

3. From a geographically limited supply chain to a more **global supply chain** (e.g., expand supply base outside of EU in order to alleviate capacity constraints)

Mindset: Transform from a regular market participant to a supply chain advocate through regulatory and lobbying efforts.

Thank You – questions?