Founded in 1988, SAITEC is one of the most prestigious engineering firms in Spain at present. It carries out its activities from a professional and independent standpoint, with a strong commitment to innovation, sustainable development and respect for the environment.
Some clients:
New spin-off from SAITEC:

Exclusive Intellectual Property of SATH

Offshore Wind engineering and PM services

Full support of Saitec's [250+] highly experienced personnel and 25+ years industry track record

Initial mission is giving support to bring the technology to market, build and certify a full-scale prototype or a demonstration model. -> DemoSATH
Sath®
Swinging
Around
Twin
Hull

Presentation for

General Incorporated Association
Japan Wind Power Association
Introduction. State of the art
Introduction. State of the art

### Cost

- High material cost
- High O&M cost

### Technical

- Durability of Steel

---

### Material

- High material cost  
- High O&M cost

### Mooring

- High mooring cost  
- High O&M cost

### Installation

- High installation cost

### Depth

- All cost increase with depth

---

- Risk for the Project
- Long term – Not short term
- Not feasible for shallow waters
- Risk for the Project
Introduction. O&G vs OW

But we are generating electricity not extracting O&G and we know it’s all about LCoE

Let’s try do something different!
## Introduction

### Proposal

- High material cost
- High O&M cost

### Cost

- Durability of Steel
- Not feasible for shallow waters

### Technical

- Risk for the Project
- Long term – Not short term

### Proposal

- CONCRETE
- SPM
- TWIN HULL
- LOW DRAUGHT
CONCRETE

- Cheap and durable material

SPM

- Reduced mooring stresses
- Plug&Play
- Feasible in shallow water

TWIN HULL

- Self stable
- Onshore construction

LOW DRAUGHT

- Feasible in shallow waters
- Stable in transport
Single Point Mooring
Scale-up Strategy
Large Wind Farms

Scalability Analysis

- Power Increase (%)
- Concrete Volume Increase

2 MW | 5 MW | 8 MW | 10 MW

Power (MW)
SATH Economic Analysis
A *smart concrete* solution to make floating competitive to bottom fixed Offshore wind

SAITEC takes part into the Floating Offshore Wind Accelerator Joint Industry Project lead by Carbon Trust.

As a result of the Project, SATH cost have been validated by key stakeholders in the Offshore Wind Industry.
Project Timeline

2013 – Beginning of the Project
2014 – EEA Grant awarded
2014 – Good results for 1/60 Scale model testing
2015 – Technology optimization

2016 – Consortium creation
2016 – Saitec Offshore Technologies Ltd. launch
2017 – 1/36 Scale model test (Sw “in the loop”)
2017 – Detail design accomplished
2018 – MW scale (2 MW) prototype installed
2019 – Test and control

2019 – Full scale prototype (6MW) installed
2020/21 – Wind farm bidding
DemoSATH

First Prototype of Floating Wind Turbine using SATH technology.

Main characteristics:
• Location: BIMEP
• 1.5MW upwnwind turbine
• Construction site: Port of Bilbao

Main objectives:
• Technically and Economically prove SATH technology
• Provision of a real offshore environment for formation purposes
Project Timeline

2013 – Beginning of the Project
2014 – EEA Grant awarded
2014 – Good results for 1/60 Scale model testing
2015 – Technology optimization
2016 – Consortium creation

2016 – Saitec Offshore Technologies Ltd. launch
2017 – 1/36 Scale model test (Sw “in the loop”)
2017 – Detail design accomplished
2018 – MW scale (2 MW) prototype installed
2019 – Test and control

2019 – Full scale prototype (6MW) installed

2020/21 – Wind farm bidding

ForthWind
Partnership with WTG manufacturer **2-B Energy** to develop several (2-3) **floating positions** in **Forthwind** wind farm in Methil (Scotland)

Main characteristics:
- 6 MW downwind turbine
- Nacelle tower
- 40 year lifetime
- Position at only 25 m deep
SATH in Japan
### Market Demands

<table>
<thead>
<tr>
<th>Challenges</th>
<th>SATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>• Need reduce current solutions costs</td>
</tr>
<tr>
<td></td>
<td>• SATH provides a competitive solution, even compared to bottom-fix (35m deep onwards)</td>
</tr>
<tr>
<td>Depth</td>
<td>• Need of solutions feasible both in shallow and deep waters</td>
</tr>
<tr>
<td></td>
<td>• Its installation is feasible from 20m deep onwards</td>
</tr>
<tr>
<td>Fabrication</td>
<td>• Floating solutions must be easily constructible</td>
</tr>
<tr>
<td></td>
<td>• Industrial production center facilities similar to shipyards</td>
</tr>
<tr>
<td></td>
<td>• 1 platform/week production</td>
</tr>
<tr>
<td>Weather Conditions</td>
<td>• Japan is looking for solutions able to withstand extreme weather conditions such as typhoons</td>
</tr>
<tr>
<td></td>
<td>• SATH technology has been technically proven for extreme conditions (tank tests)</td>
</tr>
</tbody>
</table>
Great potential for floating offshore wind

Challenging access to the Market

SAITEC IS WILLING TO COLLABORATE WITH JAPANESE COMPANIES
Thank you for your attention

David Carrascosa
CTO
davidcarrascosa@Saitec.es

Luis Gonzalez-Pinto
COO
luisgonzalez@Saitec.es

www.saitec-offshore.com