

ESA Space Solutions  
UNiversity Challenge 2014

# Petroleum Innovative Environmental Remediation



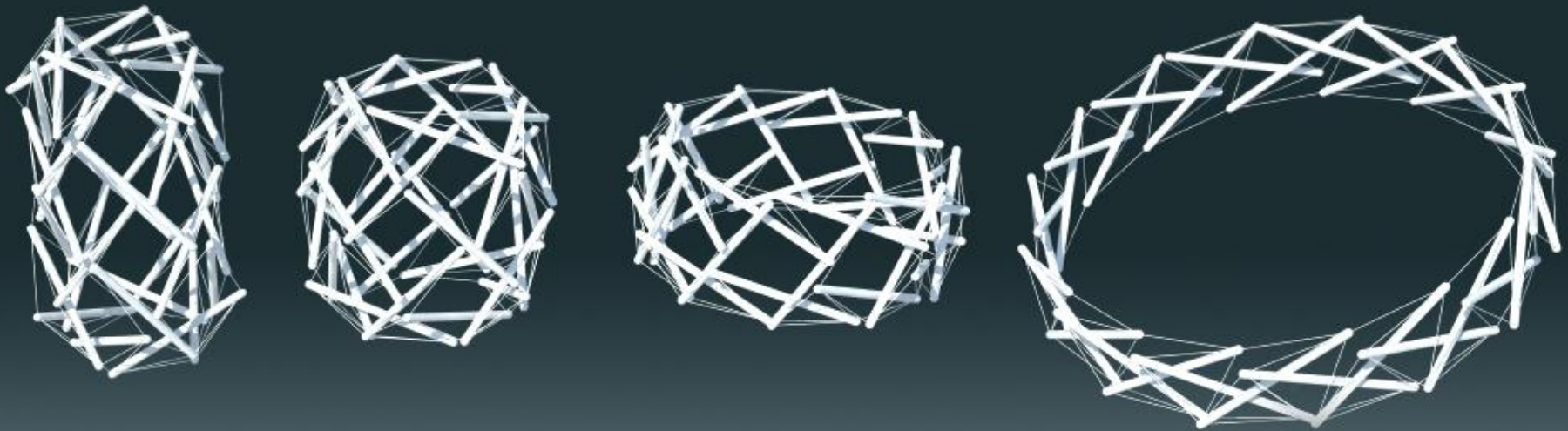
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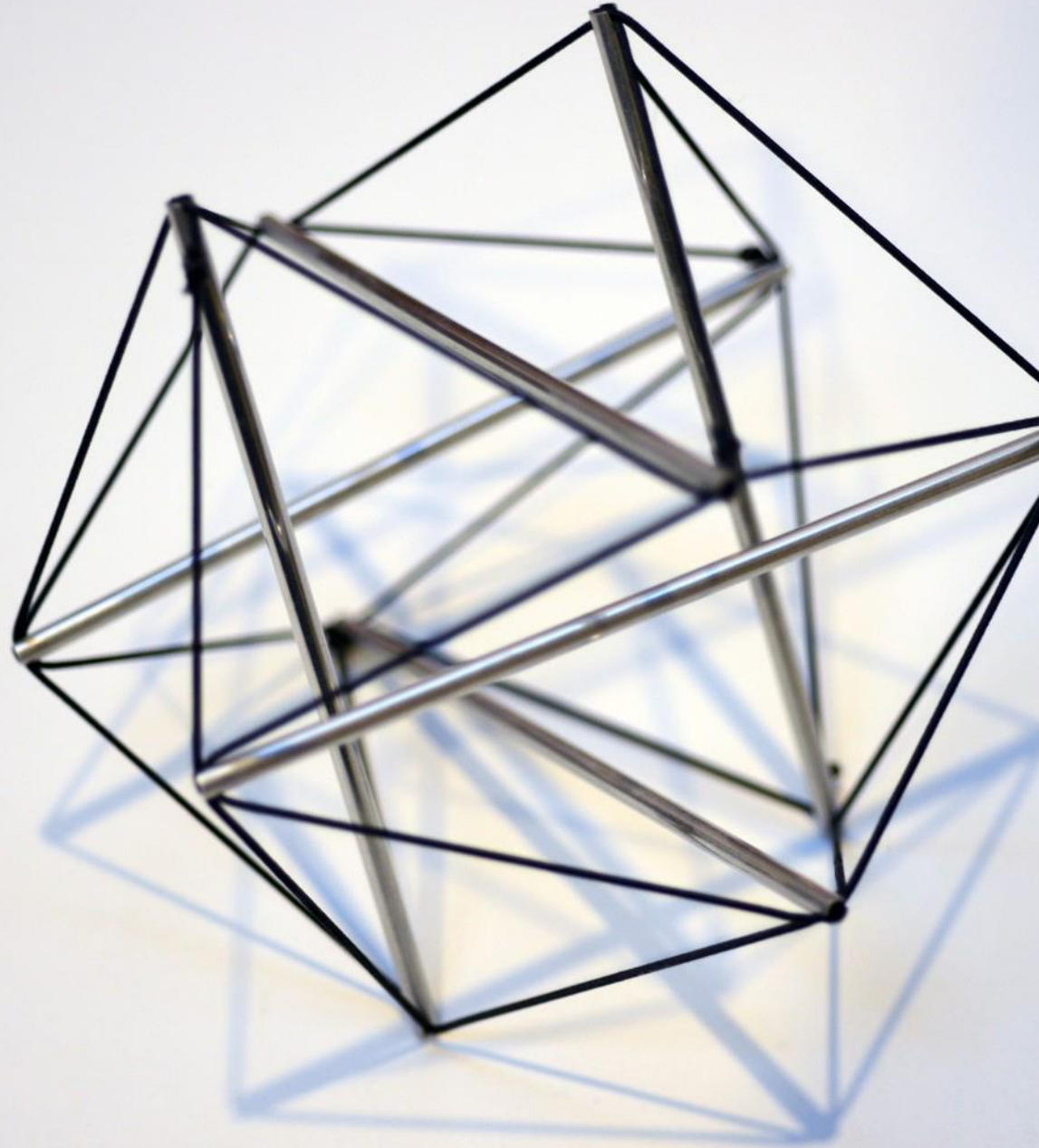
# Patent WO 2013/140201 A1

A deployable tensegrity structure,  
especially for space applications  
(reflector/aerials support)



# Tensegrity

- bars & tendons
- no bar contact
- no mechanical joint
- firm & stiff
- reliable & durable





# Sea oil leakages

> 1,7 mln  
oil barrels spilt  
in 2000 – 2013

125 \$/barrel  
cost for  
oil companies

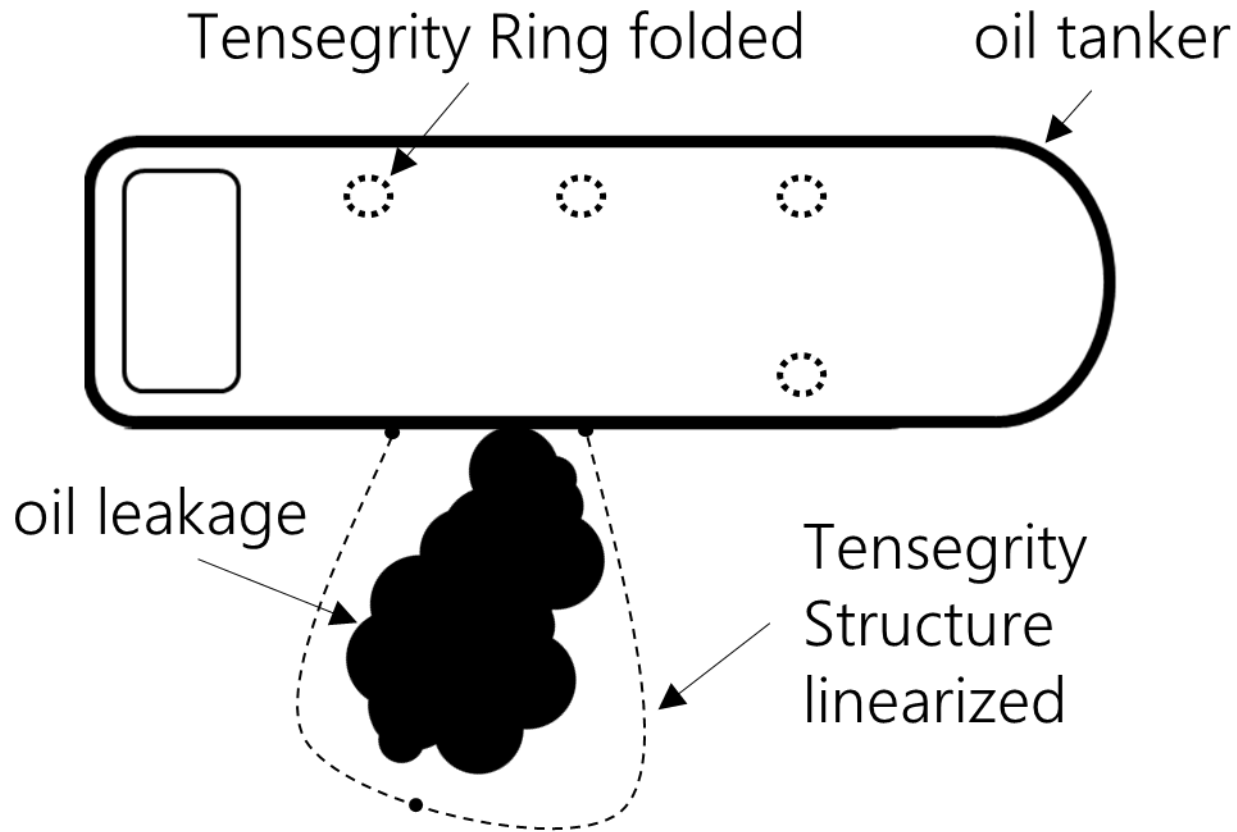


# Containment booms

- supporting ships required
- high cost (avg. price > € 40k)
- long intervention time



# The PIER system



# Value proposition

Deployable  
Containment Ring  
to be placed over  
the sea in case of  
oil leakage

stowable & portable **1/12**

quick deployment **30 min**

easily scalable

simplified logistics



# Tech Specs



deployment by means of **springs**



floating by means of **self-inflatable balloons**



**single ring or chained configuration** to contain oil spill directly when, and where, it is needed



oil-water separation **membrane**



**materials resistant** both to salted water and oil



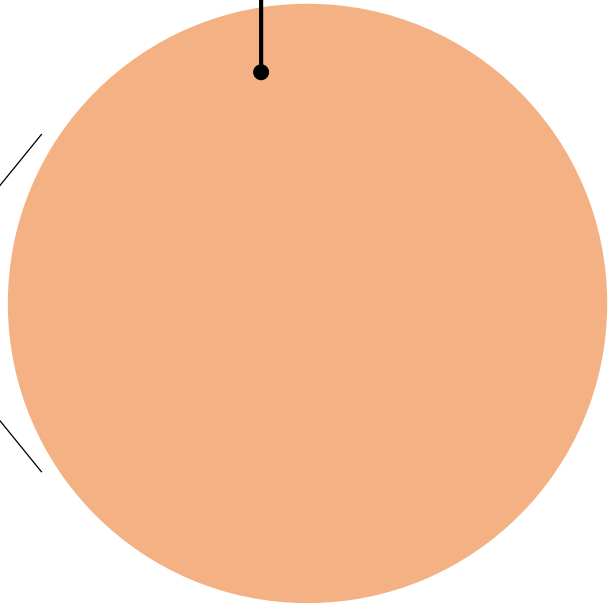
# Steps needed

- ⬡ the patent is very strong
- ⬡ need for research on materials (membrane)
- ⬡ integration of different technologies  
(airbag system + folding system)
- ⬡ folding & cleaning after use to be designed

# Oil Spill Remediation market

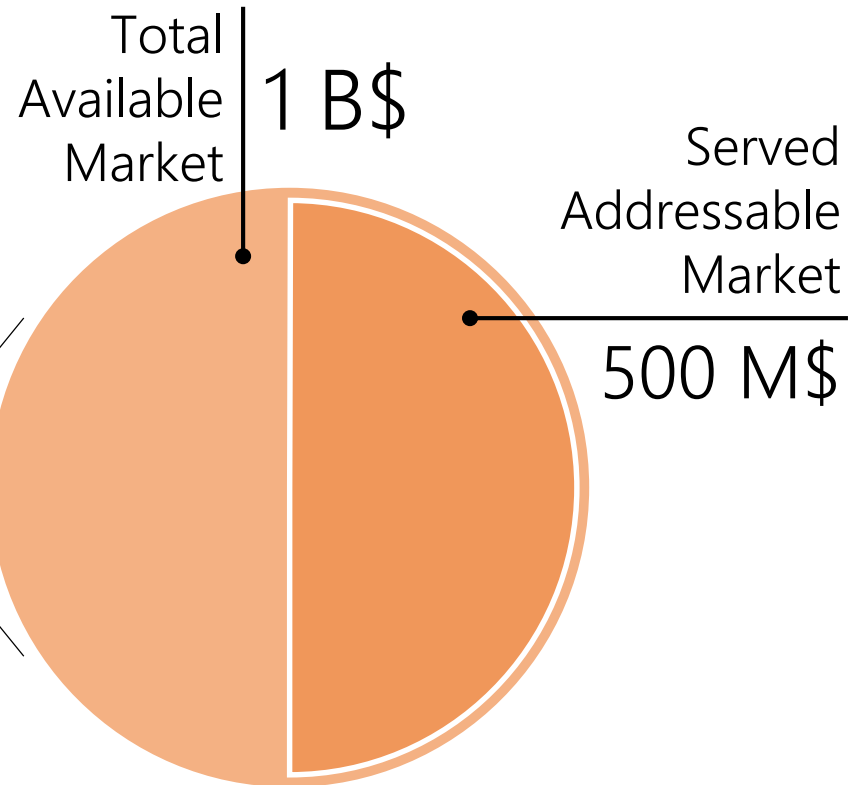
- chemical methods
- biological methods
- **mechanical containment**
- physical methods
- scare tactics

Total Available Market 1 B\$



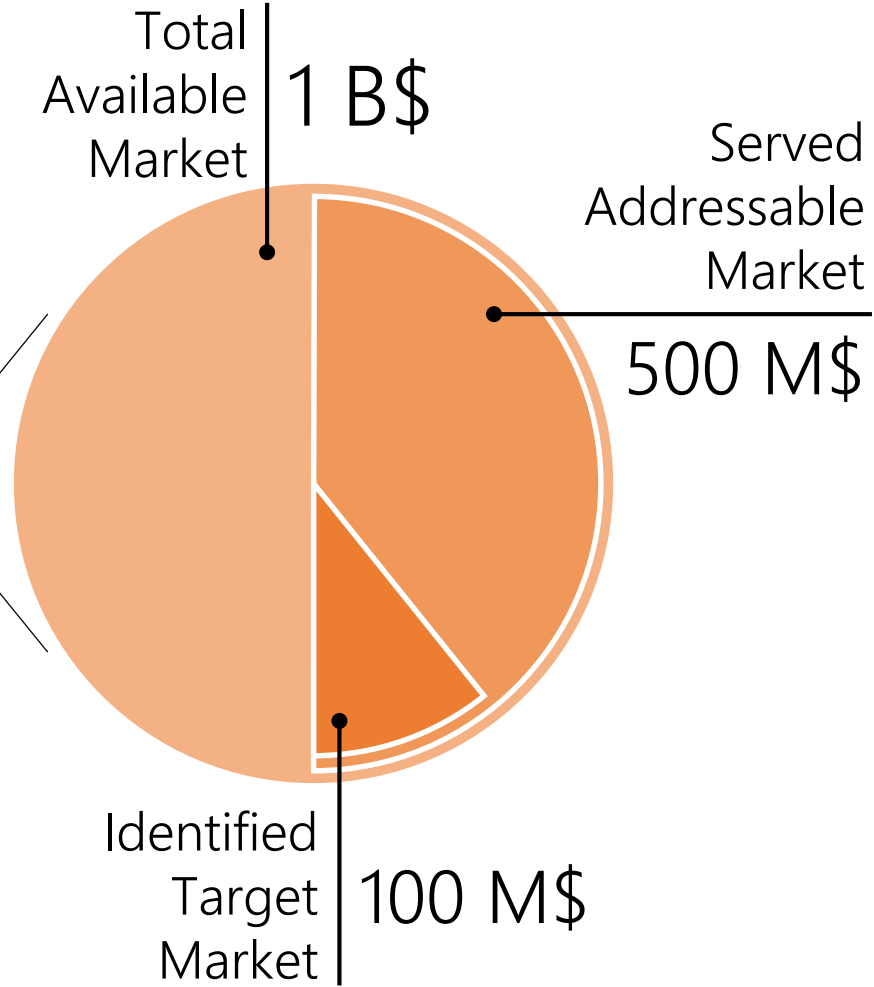
# Oil Spill Remediation market

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# Oil Spill Remediation market

- chemical methods
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# Strategy

*1<sup>st</sup> year*

R&D  
activities

Test on field  
(1<sup>st</sup> ship)

10 units  
€ 15k/unit

*2<sup>nd</sup> year*

System  
integration

Industrial  
partner search

150 units  
€ 15k/unit

*3<sup>rd</sup> year*

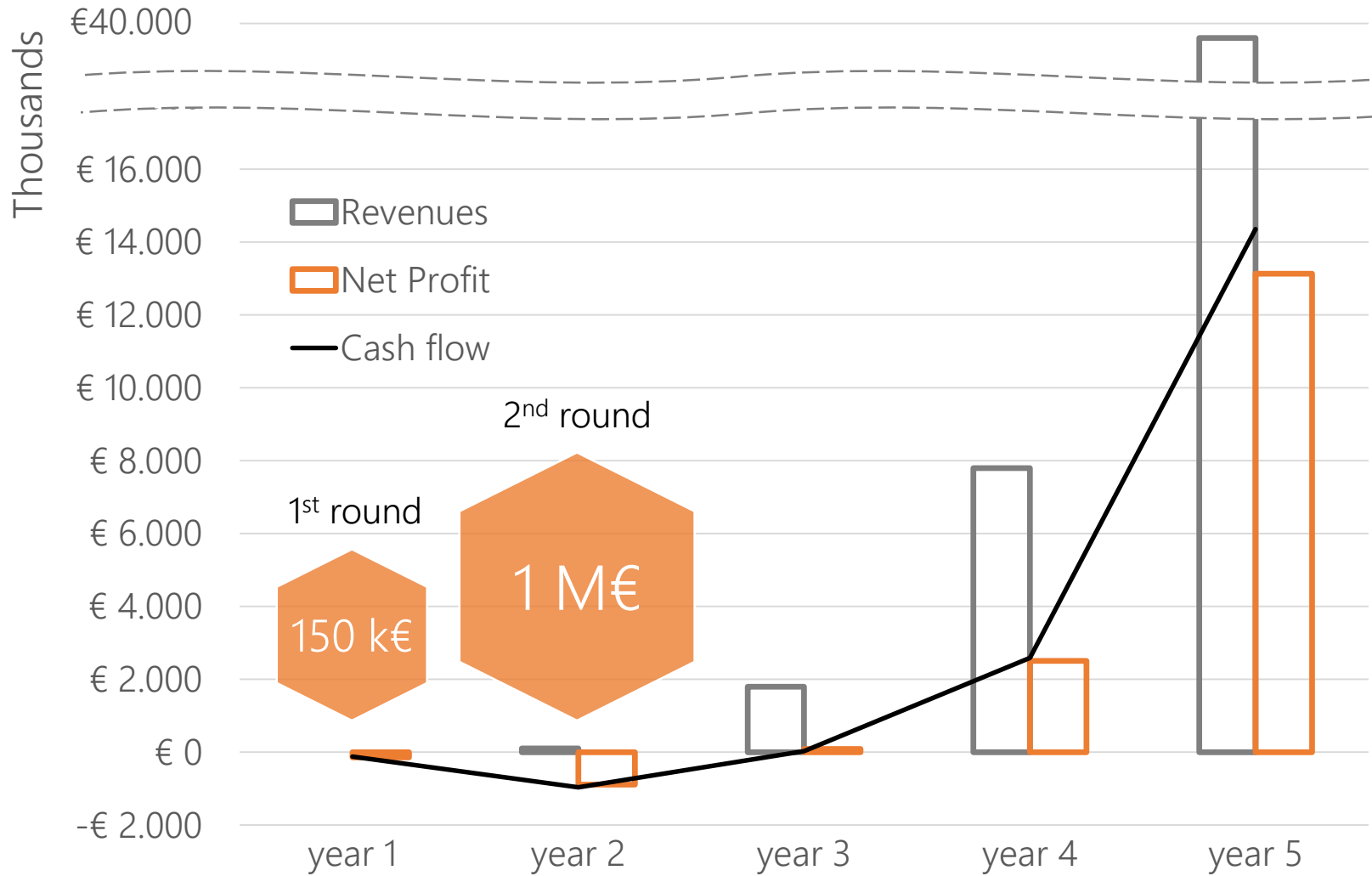
Marketing

Sales MGMT




































Larger volumes

500 units  
€ 13k/unit

# Economics and financials



# Competitors

	PIER	AIRMAX RIVER	A-BOOM	CS BOOM	RO-BOOM
<i>Optimal tolerance to varying sea conditions</i>			 *		
<i>Superior performance in oil containment</i>					
<i>Deployability</i>					
<i>Ease in storage and transport</i>					
<i>Intervention speed</i>					
<i>Large area of influence</i>					
<i>Can be re-packed and re-used</i>					 **
<i>Price (VAT excluded) in K€</i>	11 to 15	22	***	59	65

\* At least three external tension cables are required to resist even to small external forces

\*\* After each usage a comprehensive cleaning phase is needed

\*\*\* Price is not publicly available and the company did not provide this data

# Final recommendations



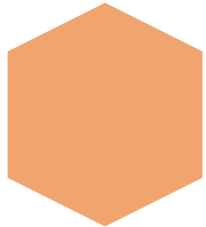
strong focus on R&D activities



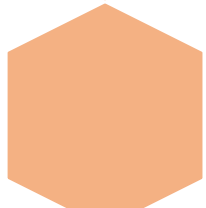
strategic partnership with oil companies



development with customers and final users



long term expansion to other segments  
(cruise ships, harbors, Coast Guard)





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