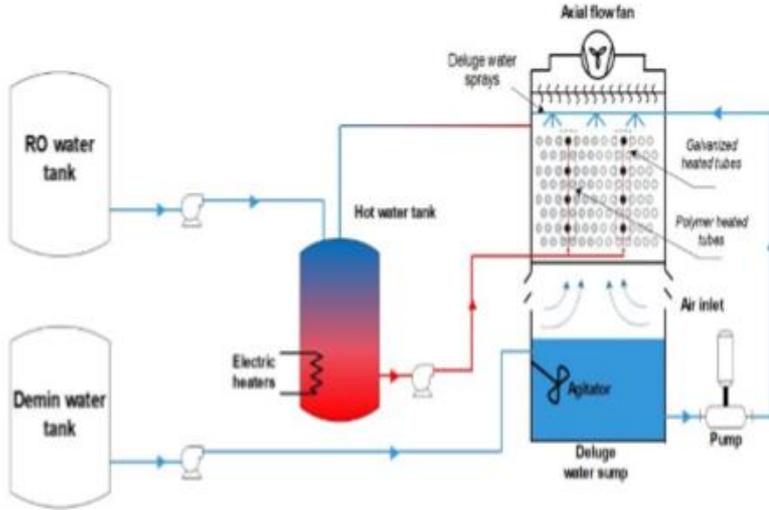




Fouling  
Shrimp

Heat Exchanger re-invented

# What is a Heat Exchanger



Overview of the test rig facility at the Green Energy Park



Schematic diagram of the hybrid cooling system experimental set-up

# The last 4 years



**FUTURUS**  
PLUS DE VIDÉOS

**AFAF ZAZA**  
PHD STUDENT IN HEAT EXCHANGERS, IRESEN

# The problem is real

Heat Exchangers



Fouled

Clean

Multiple agents representing **the biggest consumer of heat exchangers in Morocco (OCP)** have told us this is a *real* problem, and expressed the need for innovative solutions

# SOLUTION

Our solution named "Fouling Shrimp" uses a **fused IoT device** with a **3d printed heat exchanger**, to actively prevent fouling,

eliminating **40% of the overall lifetime cost** of the heat exchanger.

# m.v.p

Heat exchangers now on average cost \$1000 and **for every \$3**  
spent to buy a heat exchanger, the company  
**spends \$1 extra** yearly for average  
**15 years due to fouling**

With our design, you spend **40% OFF** that's it.



# Our Market research



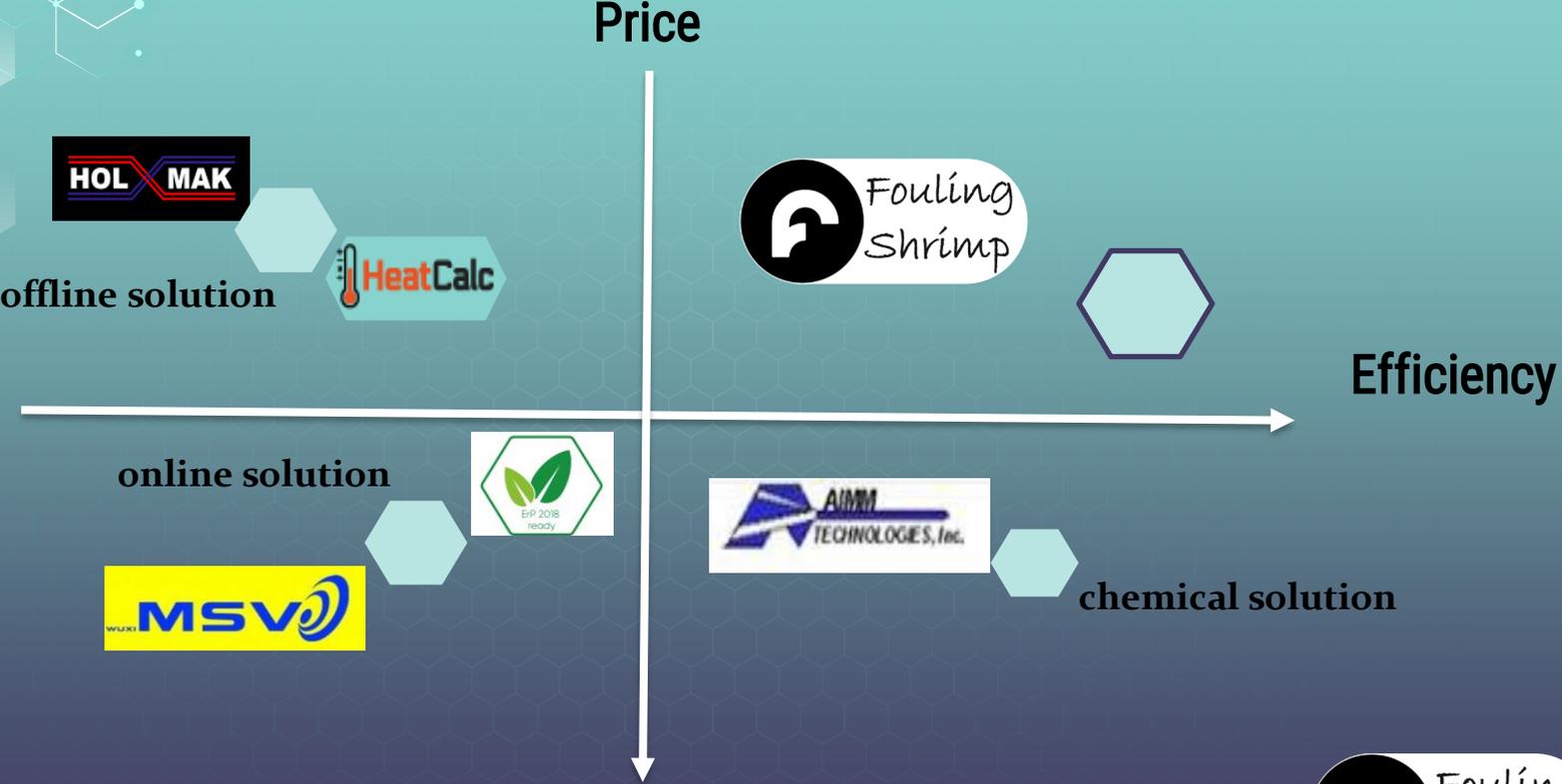
“ The fouling of heat exchangers is a wide ranging topic covering many aspects of technology,

It represents a challenge not simply in terms of reducing products cost, and hence competitiveness in the market place, but also with the concerns of modern society in respect of conservation of limited resources,

for the environment and the natural world, and for the improvement of industrial working conditions. ”

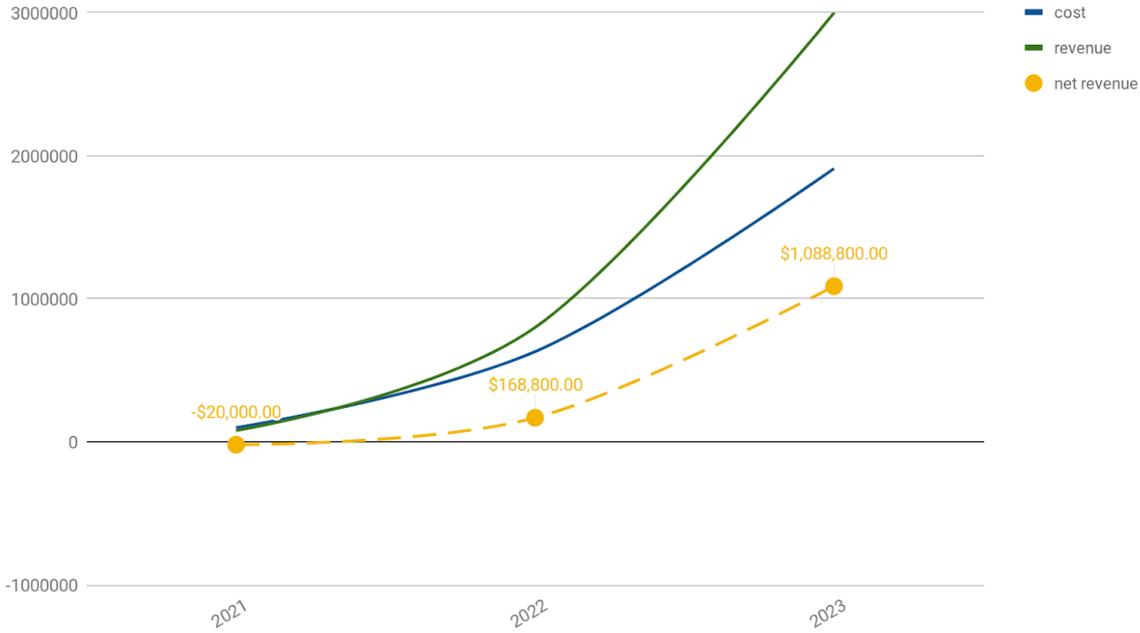
- ✓ Confirmed, Fouling is a costly problem
- ✓ Current solution cost a lot in maintenance

# Unique Advantage



# 3 years Scoop

3 years Scoop



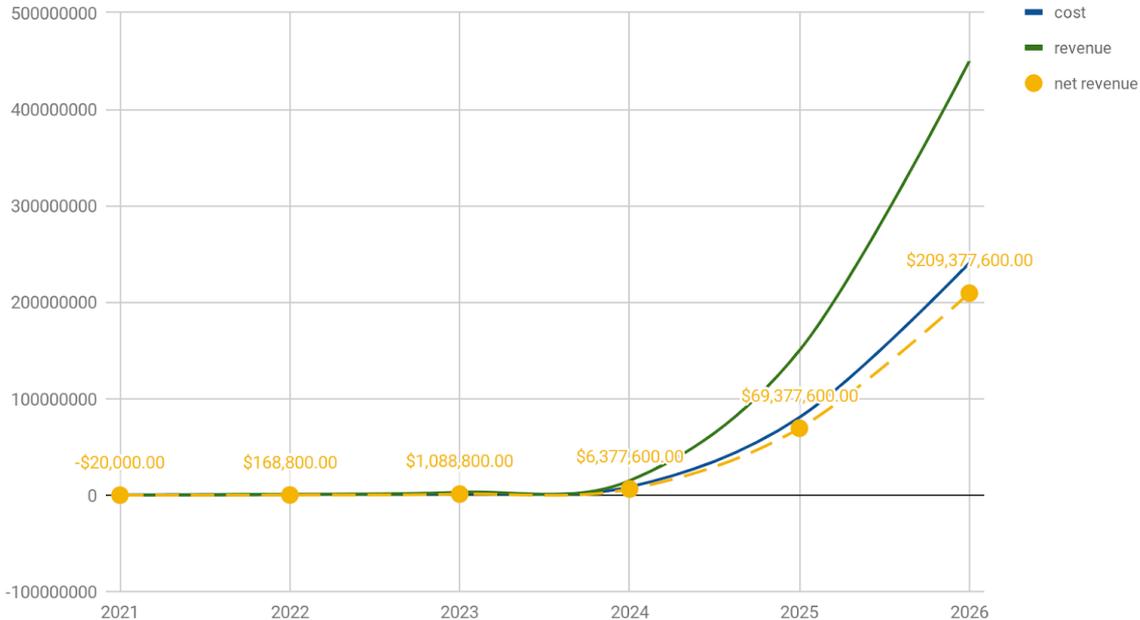
26M\$ SOM

Capture 5% of Moroccan market, (\$1,3M)



# 6 years Scoop

6 years Scoop



Capture **4%** of the European market and **specialize in tubes** (~\$200M)  
SOM --- \$1,3M

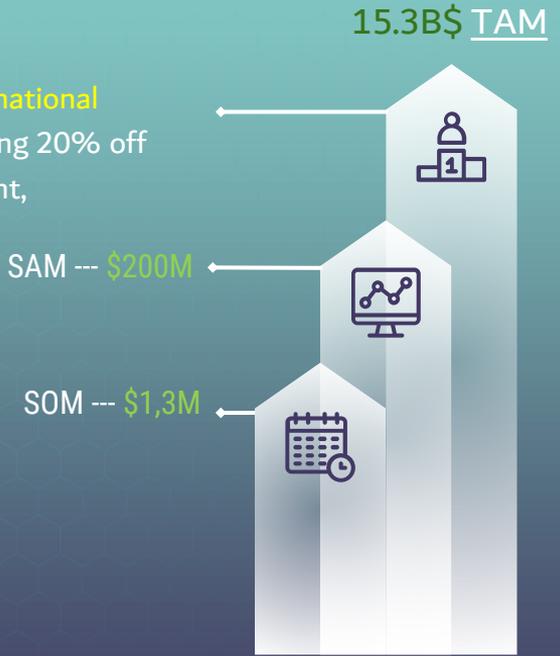
6.9B\$ SAM



# Revenue Stream



Partner with international manufacturers, charging 20% off licensed patent,  
**\$5B**



# OUR TEAM



Afaf ZAZA  
Phd Student in Heat  
Exchangers  
4+ years in the field



Zakaria ZAZA  
IT engineering student

**Thanks For Your  
Attention**