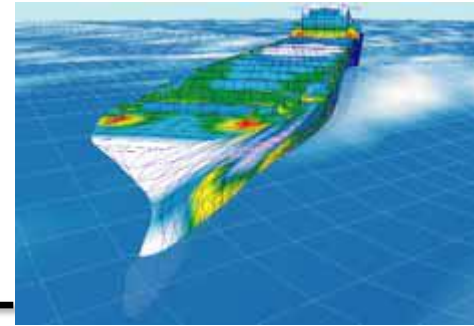


ClassNK R&D Activities in Singapore, Collaborations & Policies

Singapore Office
Y.F. Wang

R&D Activities at ClassNK



1. Research Institute
In house R&D for Classification Duties
2. Practical R&D Promotion Division
Joint R&D with industry, Academia & Government



Global Research & Innovation Centre
(GRIC)



2015 onwards

1st R&D Centre outside Japan

2014



Total 8 projects with *IHL's & Research Institute's

2011



MOU signing
with NTU



*IHL – Institute of
Higher Learning

Ideal as R&D Centre

- Maritime Nation
- Government Funding Support
- Spore as R&D Hub

Business

- Ease of Business Setup
- Financial Assistance
- Ease of IP application & IP security

Global Research & Innovation Centre (GRIC)



Experience

- Marine & Offshore expertise
- Major shipping companies based in Spore

Knowledge

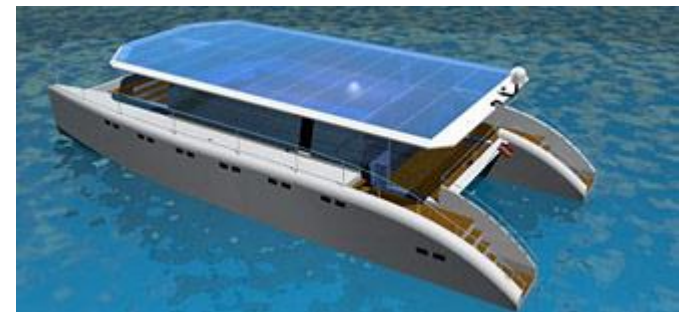
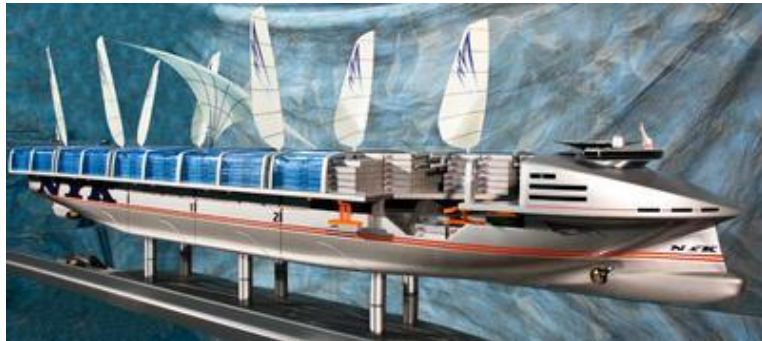
- IHL's & Research Institute
- Existing manpower
- Future manpower development



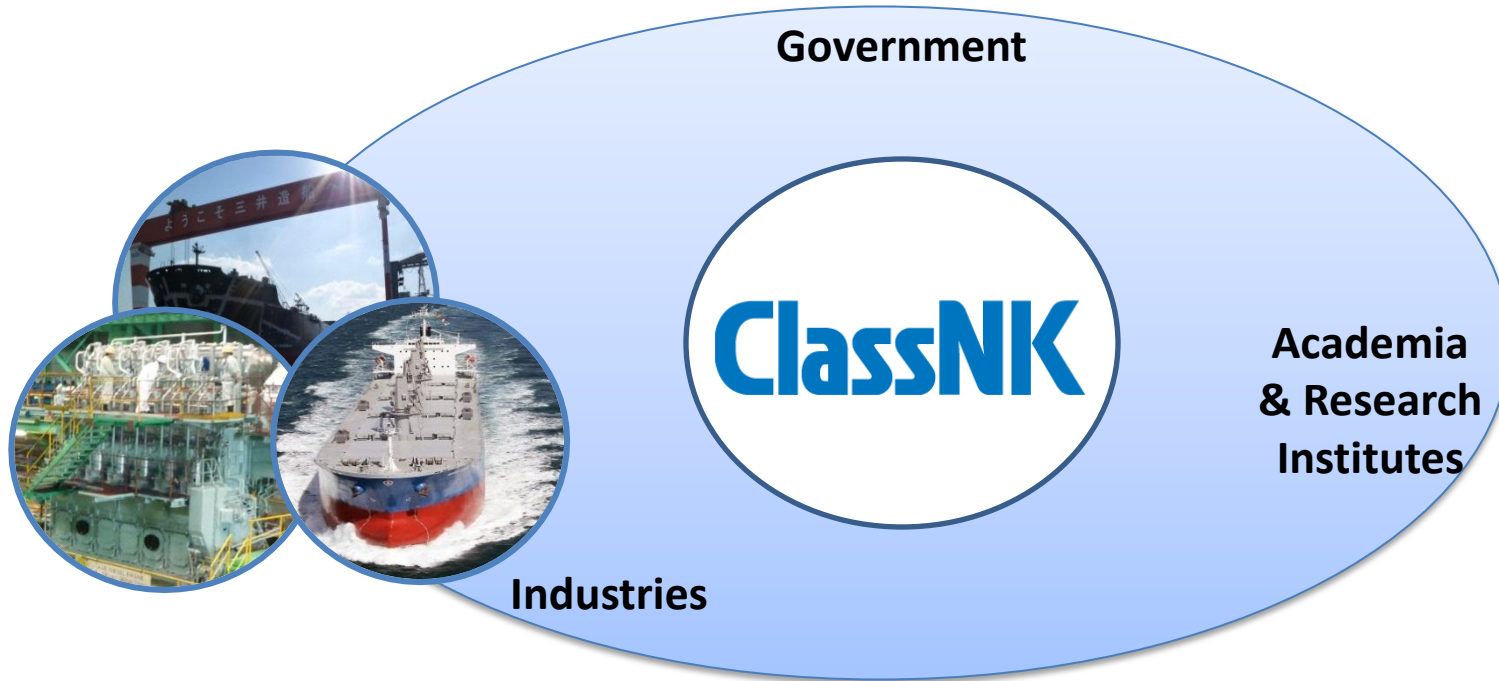
Maritime Technologies R&D

Focus Areas:

- Safe & Smart Ships
- Environment Friendly Ships
- Future Technologies
- Joint Industry Programs

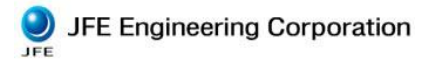


GRIC Approach to R&D in Singapore - Collaborations



Our Partners:

with Industry



with Academia

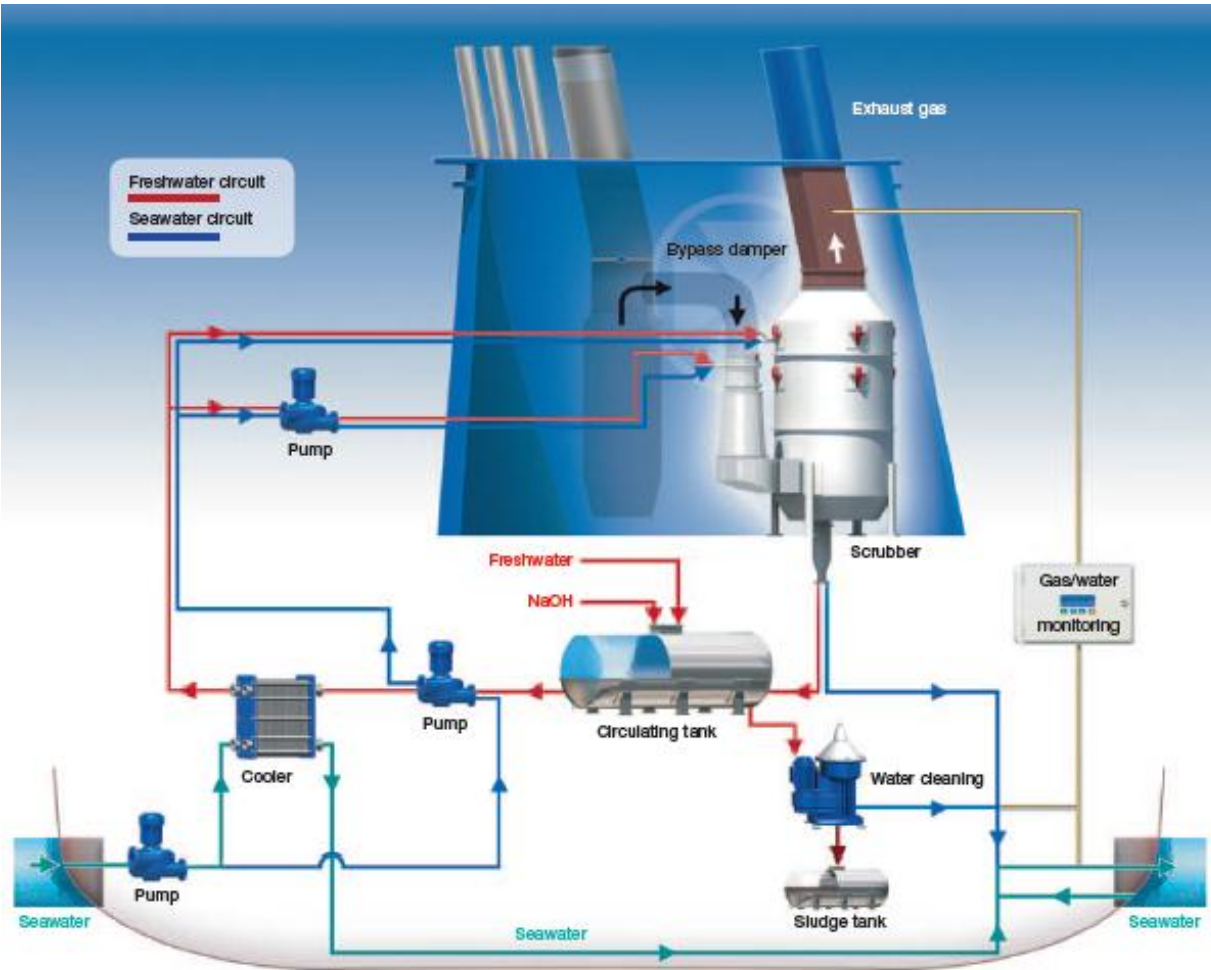


with Government



Marquee Projects:

Develop Technologically Advanced Exhaust Gas Cleaning System



Research Objectives:

1. To reduce the size and cost of existing EGCS to be suitable with SO_x regulation in non-ECA
2. Development of a total solution of EGCS
 - Washwater treatment
 - Sludge handling at port
 - CO_2 reduction
3. Installation and Shipboard Trial

Develop Technologically Advanced Exhaust Gas Cleaning System

➔ Joint R&D between Industry, Academia and Government



Partners:



Energy Research Institute @ NTU

ClassNK

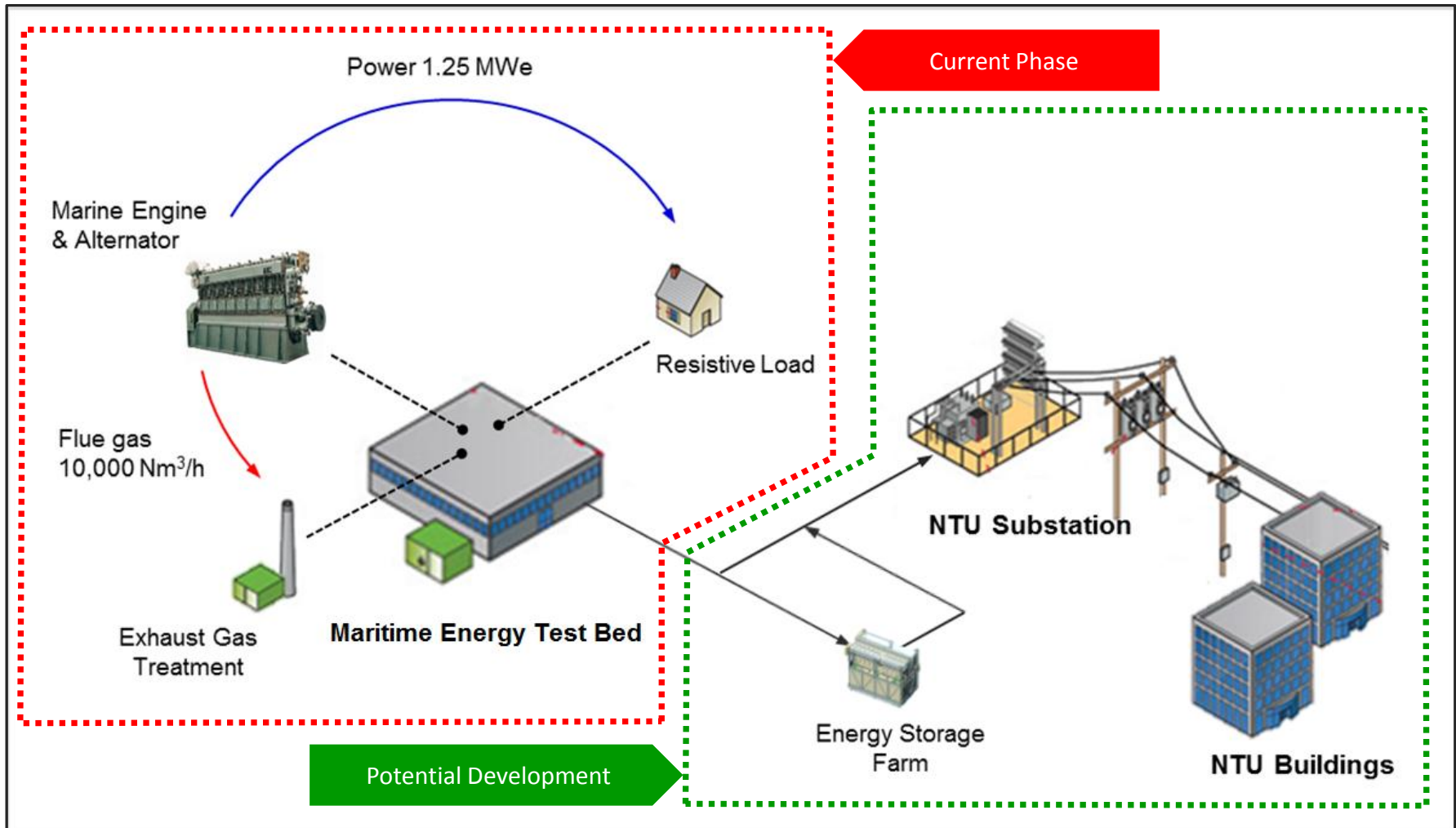


Funded by:

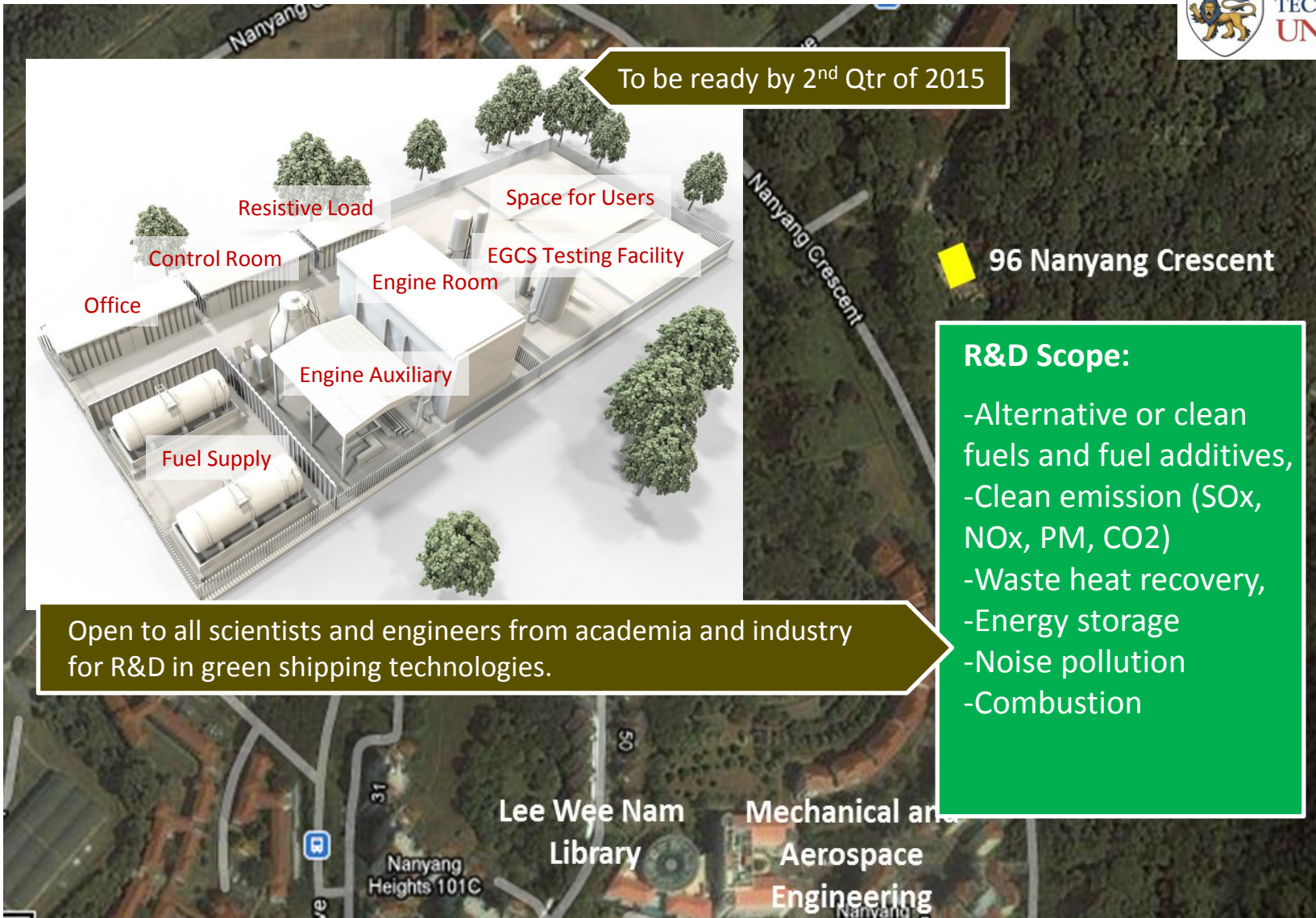


with Academia -Maritime Energy Test Bed-

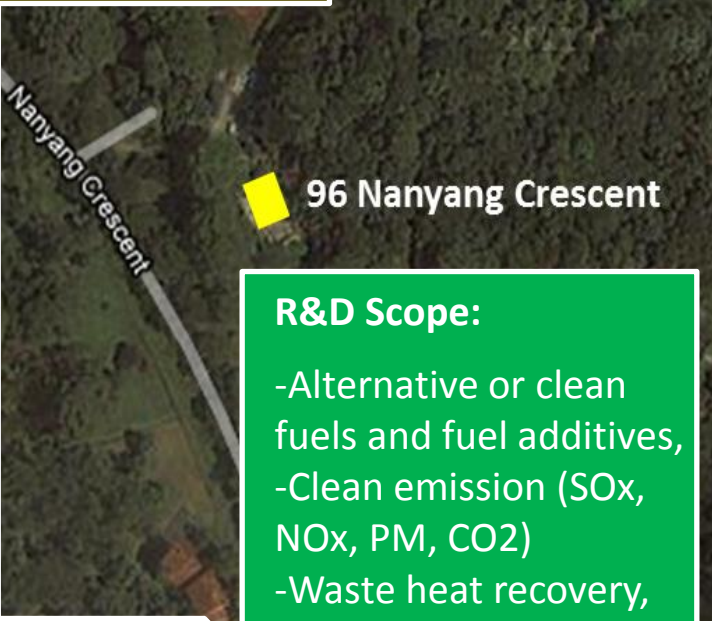
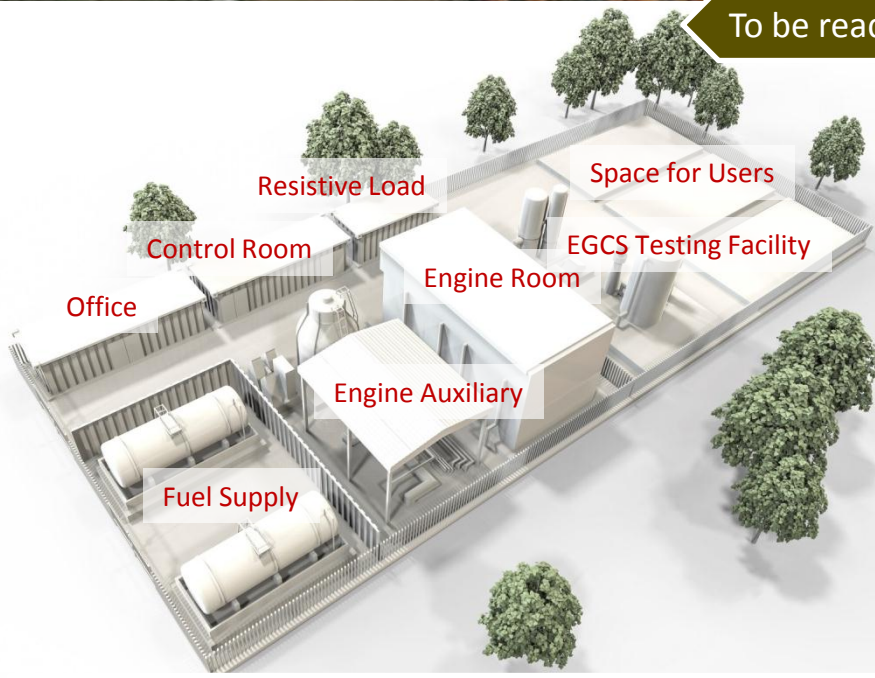
To support R&D of leading-edge innovations for maritime industry



with Academia -Maritime Energy Test Bed-



To be ready by 2nd Qtr of 2015

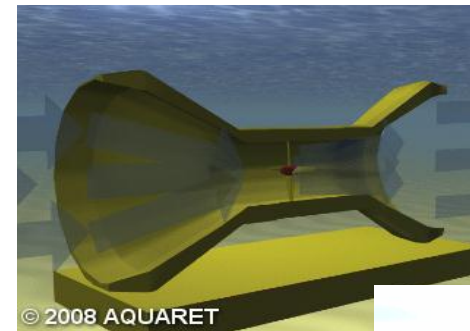
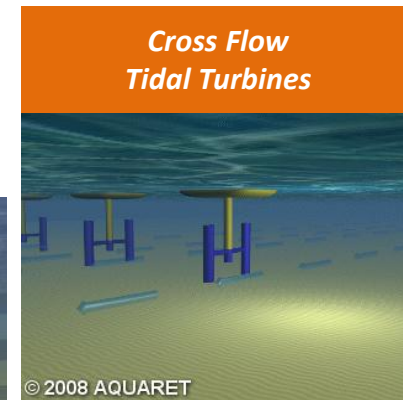


- R&D Scope:**
- Alternative or clean fuels and fuel additives,
 - Clean emission (SO_x, NO_x, PM, CO₂)
 - Waste heat recovery,
 - Energy storage
 - Noise pollution
 - Combustion

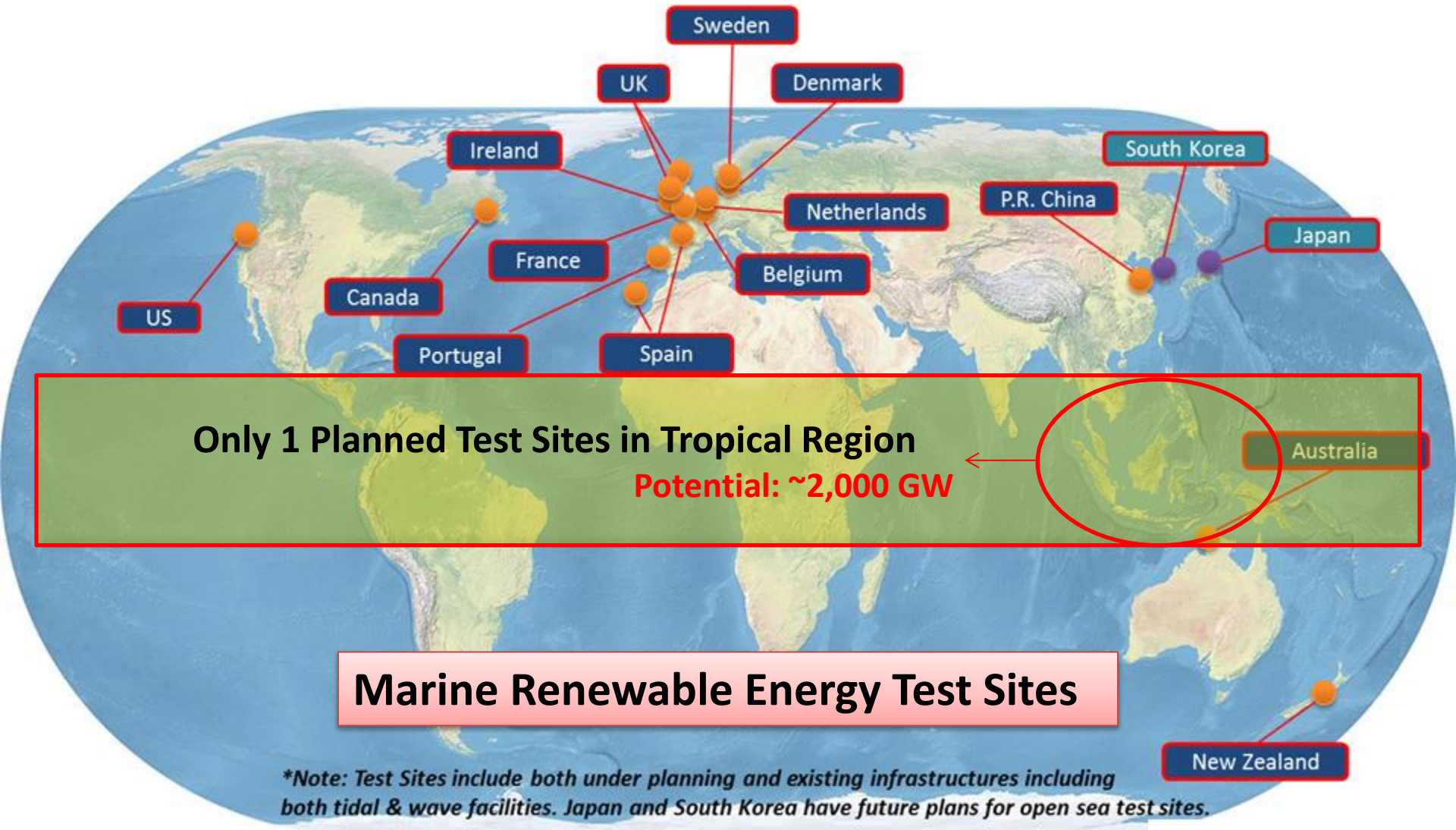
Open to all scientists and engineers from academia and industry for R&D in green shipping technologies.

Marine Renewable Energy Scale up Test Site In Singapore Focus on Tidal In-Stream Energy

- MRE industry is still at it's infancy stage
- Requires more R&D at laboratory level and scale up or nursery test site
- Marine & Offshore industry experience is needed for installation and operations
- Study local resource assessment and marine ecosystem

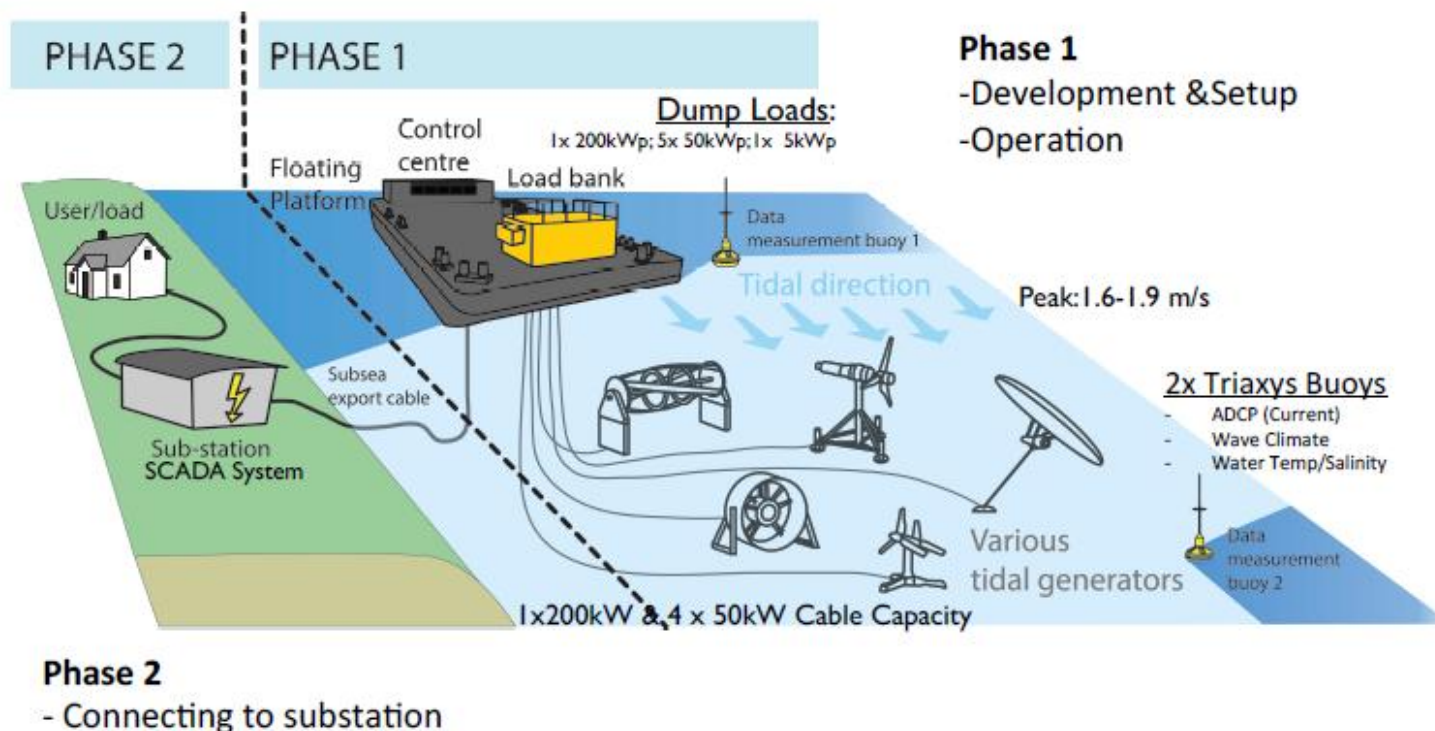


Surface Bio-Fouling



ClassNK funds and supports a feasibility study for the planning and development of the test site in Singapore.

- Site & Resource Assessment (Southern Singapore)
- Environment Impact Studies & Risk Assessment
- Tidal In-Stream Site-Device Studies



Marine Renewable Energy Green Shipping & Ports

Besides R & D on: Biofouling, Floating Structures, Device Studies for tropics

Charging Station
Hybrid Boats

Cable
connection

Besides R&D on:

- Biofouling
- Floating Structures
- Device Studies for tropics
- Deployment methods
- Marine Ecosystems

Energy Storage

Floating Device with
submerged Turbine

- ✓ Engaging in R&D activities that will ensure the safety of life and property at sea and protecting the marine environment.
- ✓ Nurturing innovation through R&D activities that will contribute to the progress of the maritime industry locally and globally.

THANK YOU

for your kind attention

