



Vaasan yliopisto
UNIVERSITY OF VAASA

Seppo Niemi
VEBIC - Vaasa Energy Business
Innovation Centre

March 22, 2018
School of Technology and Innovations

VEBIC outline

- Energy and sustainable development are in the core of the University of Vaasa strategy 2017–2020
- VEBIC includes
 - Internal combustion engine and fuel laboratories
 - Multidisciplinary research platform that involves all four schools of the university
- Combined research activities cover:
 - New energy technology and the impacts of its adoption on business and the wider society



VEBIC financing

- University of Vaasa
- Business Finland
- ABB
- Citec
- Danfoss Vacon
- Leinolat
- Pohjanmaa Chamber of Commerce
- Vaasa Parks
- Vaasan Sähkö
- VEO
- Wapice
- Wärtsilä Finland
- Syrenius fund
- Ministry of Education and Culture

BUSINESS FINLAND

Vaasan yliopisto
UNIVERSITY OF VAASA

ABB

LEINOLAT
GROUP

citec

**ÖSTERBOTTENS
HANDELSKAMMARE**

Ministry of Education and Culture

Vaasa Parks
- Kasvun rakentaja -

**VAASAN SÄHKÖ
VASA ELEKTRISKA**

Danfoss VAGON®

VEO

Viljo Syreniuksen rahasto

Wapice

WÄRTSILÄ



VEBIC boards

VEBIC advisory board

- Some 30 executives representing business and public administration

VEBIC scientific board

- Headed by Professor Christoph Böhringer (German Federal Government energy advisor)
 - Five international academics support and contribute to the strategic research agenda



Leverage from
the EU
2014–2020





University of Vaasa

VEBIC ENGINE AND FUEL LABORATORIES AND ACTIVITIES

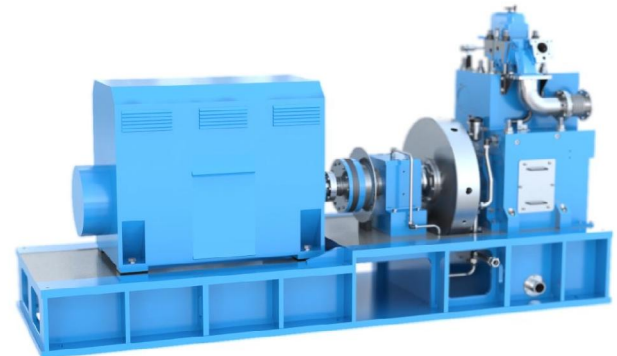
Laboratory concept

- Wärtsilä supplies two diesel engines for the research laboratory use
- ABB and others active in laboratory planning and construction
- University invests in the laboratory and research facilities
- University operates the laboratories



Engine laboratory

- Two medium-speed marine or power plant engines
 - One multi-cylinder engine
 - One single-cylinder research engine
- One to three high-speed non-road engines
- Fuel injection test bench
- Electric equipment
 - Alternators
 - Frequency converters
 - Transformers
 - Gen-set automation system
 - Data acquisition system



Fuel laboratory

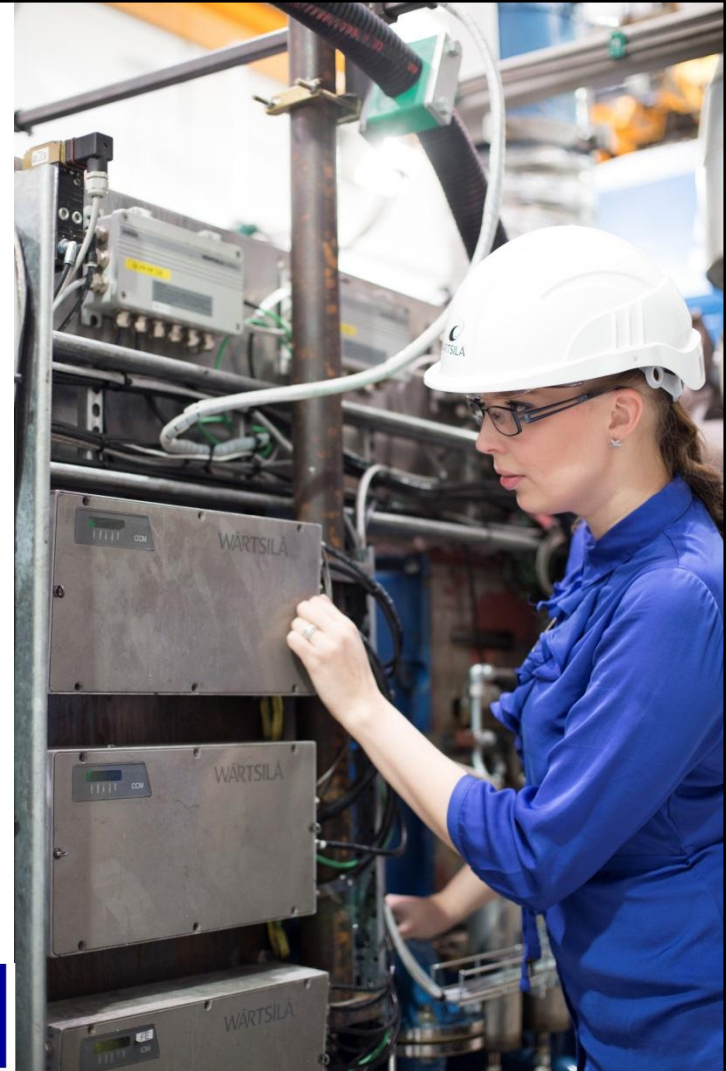
- Close cooperation with the engine laboratory
 - Unique combination of fuel and engine research
- Fuel and lubricant studies
- Regional cooperation with other chemistry and environmental laboratories
 - Vaasalabs Cluster



Projects of VEBIC

EU Hercules 2 – Flexible fuel large marine engine

- Fuel flexibility
- Engine control system development
- Exhaust after-treatment solutions



Further projects of VEBIC



- Ongoing
 - AIKO Gas CoE
 - Integrated Energy Solutions to Green Shipping
 - Suupohja biogas
 - Fuels from algae
 - Geoenergy
 - Company projects on fuel and lube oil analyses
- Under planning
 - EDGE
 - Circular Energy in Maritime Business & Sun Fuel
 - Silent engine
 - CleanShip





Customers and partners



www.feora.fi

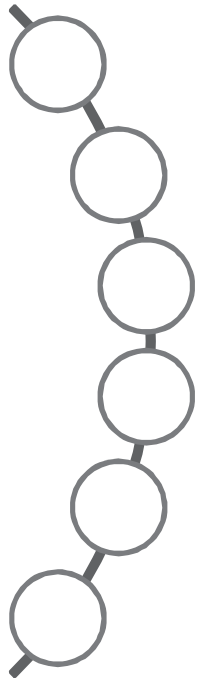


VEBIC status

- Fuel laboratory in full operation
- Wärtsilä 4L20 engine started
 - First experiments completed
- Transfer of SCE planned
 - Scheduled in 2019
- High-speed engine still available at another building
 - Transfer scheduled in 2019
- A fuel injection test rig under planning
 - Scheduled late 2018



Future: VEBIC entity



Fuel Lab

Engine Lab

Geoenergy

Smart Grid Lab

Communications Lab

Distribution network

- Energy production
- Digitalization ecosystem
 - Smart Grid Laboratory
 - Protection-automation-control platform
 - Simulation
 - Business from data analysis
 - Energy efficient region



Antila, E.,
Kuusisto, J. and
Niemi, S. (2016-
2017)

More information about VEBIC

<http://www.uva.fi/en/sites/vebic/>



VEBIC - Vaasa Energy Business Innovation Centre

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VEBIC in numbers:

- 30+ partner companies and organisations
- Two laboratories
- EnergyLab building 6.5 million euros
- VEBIC laboratory 4.0 million euros
- Gross area of VEBIC laboratory building 3,268 m²

Leverage from
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