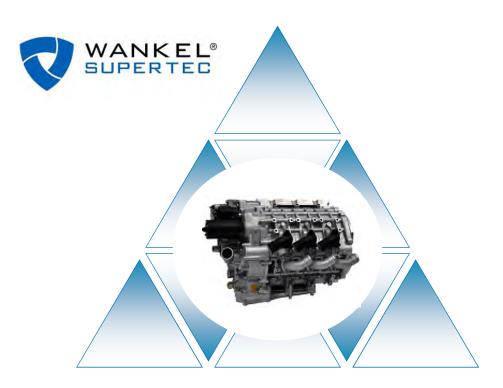


Hydrogen & Multi-fuel Engines for Sustainable Power & Mobility

### WST at a Glance





### **Existing fields of business:**

- Light Aircraft & Drones
- Power Generation
- Marine

#### New field of business:

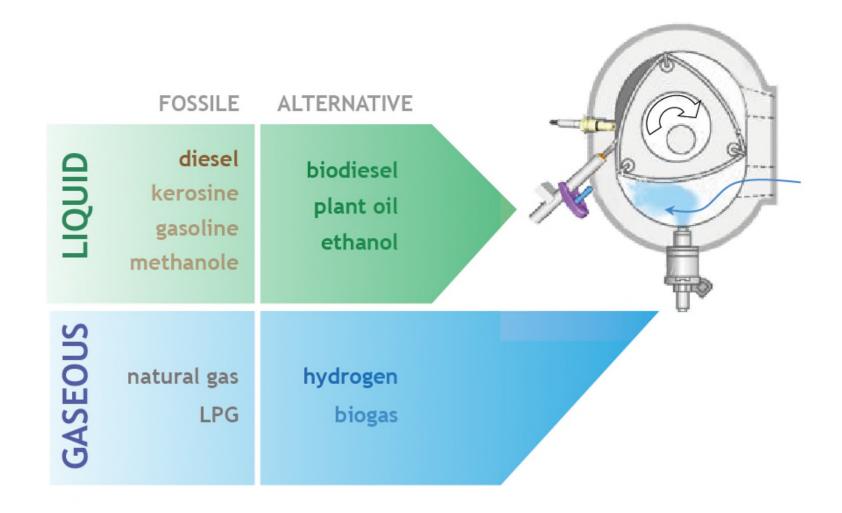
Hydrogen engines & dualfuel range extenders for electric vehicles

- Wankel SuperTec GmbH ("WST") is specialized in the development of advanced rotary engines
- Established some 20 years ago out of Cottbus Technical University, it is technology leader in its field
- WST is the only company producing rotary engines that can run on Diesel fuel
- Combines attractive, scalable existing business with high growth potential in clean mobility
- New business model and successful restructuring after change of management in mid-2018:
- ⇒ From research institute towards industrial company

## **Special Features of WST Rotary Engines**

- Multi-fuel Capabilities

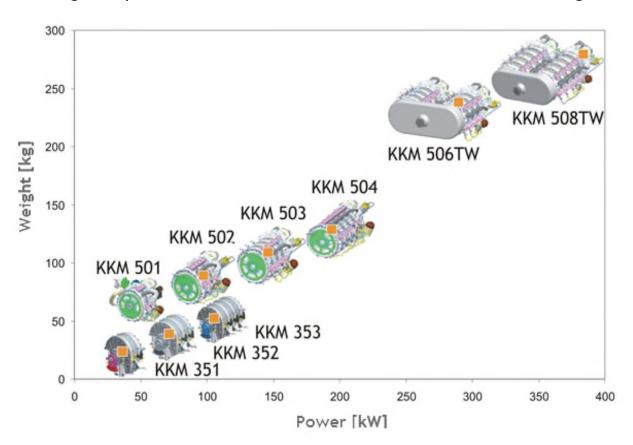




### **Existing Engine Series**



### Weight to power ratios of WST's KKM 350 and KKM 500 series engines



(power output for use with conventional fuels)

### All WST-engines feature

- high reliability
- excellent power to weight ratio
- low vibrations
- multi-fuel capability
- modular design
- WST's own ECU (hardware and software)
- patented sealing and lubrication designs
- increased efficiency and reduced exhaust through propriatory fuel injection and ignition technology

# Existing Fields of Business: Light, Small and Low-vibration, High-power Diesel Engines



Wherever excellent power-to-weight ratio, low vibrations and operation with Diesel fuel are important - examples:



## Light aircraft & Drones

Equator Aircraft's hybrid amphibious airplane, powered by WST KKM 352 Diesel engine (picture courtesy of Equator Airplane Ltd.)

## Power generation equipment II

Deutsche Bahn, Germany's railway company, has since 2015 equipped a total of 60 Diesel lokomotives with our auxiliary power systems, using WST KKM 351 Diesel engine





# Power generation equipment I

compact and lightweight 30 kVA power generation unit, equipped with KKM 501 Diesel engine

#### Marine

small & light C-Fury RIB powered by WST KKM 352 Diesel engine (picture courtesy C-Fury Ltd.)



# New Field of Business: Dual-fuel Range Extenders for Electric Vehicles



### **Main Features**

- With rotary engines at the core
- Driven by hydrogen
- But also able to run on conventional fuels

#### **Main Advantages**

Over pure battery cars:

- Allows reduction of battery size & costs
- No rare materials needed
- No dependency on charging stations, no long charging stops, no use of conventional electricity

#### Over fuel cell cars:

- Does not depend on supply of hydrogen
- No rare materials needed
- Easy & cheap to produce and repair
- long life-time

Over conventional engines & range extenders:

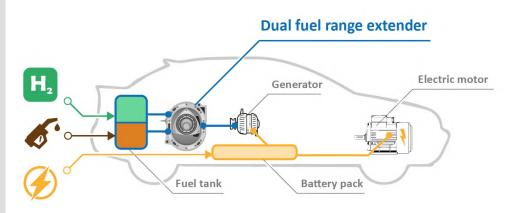
- Pollution-free if run on hydrogen
- Small, light, low vibrations

disruptive technology for sustainable mobility



Above: WST range extender prototype

### One car - 3 sources of power



# Ways to Market 2 successfully applied approaches



### 1. Engine sales to system integrators

- Successfully applied for drones & aircraft, marine and power generation
- Intended also for sale of range extender systems to automotive OEM's, particularly younger manufacturers of electric vehicles
- Long-lasting partnerships with customers who build their products around our engines
- Leads to growing sales as customers develop their business



# 2. Sourcing of system components, equipment with engines and sale to end-users

- Successfully applied for power generation equipment sales to Deutsche Bahn
- Intended for increase of sales of power generation equipment

Provides second, more pro-active sale of dual-fuel range extender systems

- Sourcing of suitable electric vehicles from strategic partners
- Equipment of these vehicles with dual-fuel range extender system
- Sale of complete vehicles to end users



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### Financing & Investment Opportunity



- New and existing public subsidy programms offer excellent chance to finance our further growth (several applications pending respectively under application)
- Operating profits and subsidy applications complemented by presently ongoing crowdfunding campaign

www.fundernation.eu/investments/wankelsupertec

Or

www.wankelsupertec.de/en\_ir.html

### **Contact Information**





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