



Power and Flow Mechanical Engineering

SEPTEMBER 12TH, 2022

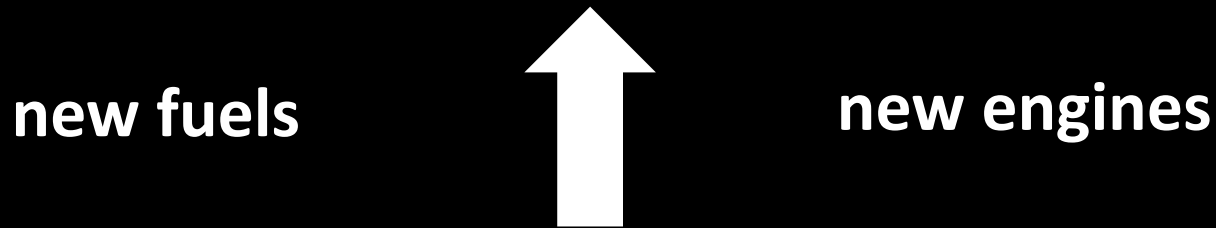
Xiaocheng Mi (x.c.mi@tue.nl), Assistant Professor

SET Specialization Meeting

About power generation

Clean words: Battery, electricity, renewable, solar, wind, zero-emission ...

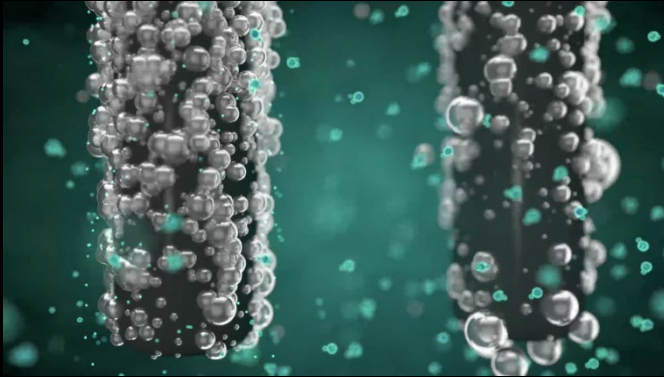
~~Clean words: Combustion, fuels, combustion engines....~~



What does P&F Group do?

Clean energy pipeline enabled by hydrogen

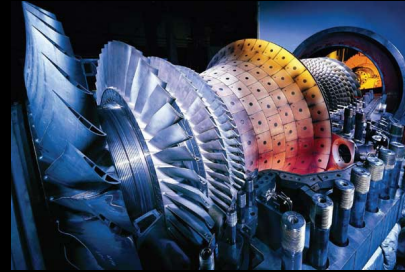
Electrolysis—Produce H_2 from water



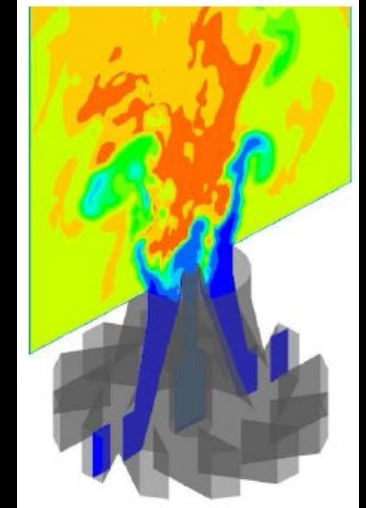
Understand and control bubbly flows
(Prof. Niels Deen, Dr. Yali Tang)



Burning H_2 to generate power

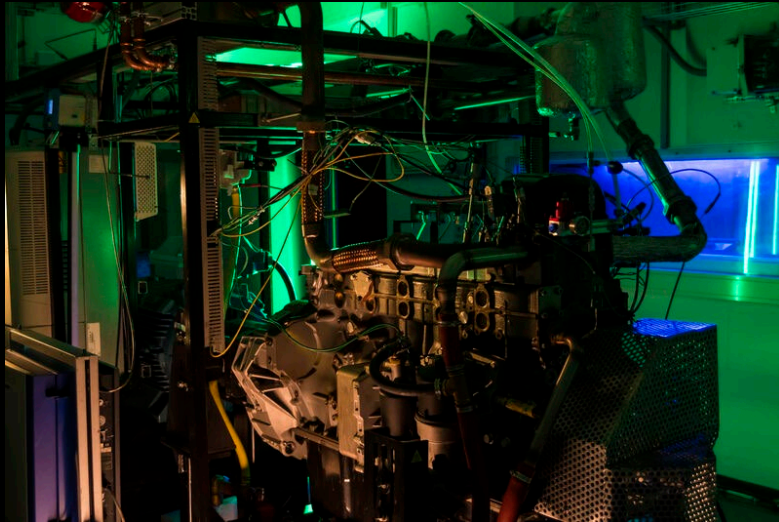


Advanced CFD modelling
of H_2 combustion
(Profs. Jeroen van Oijen,
Bart Somers, and Rob
Bastiaans)



Clean energy pipeline enabled by **hydrogen**

Build new engines burning **hydrogen** and **e-fuels** for heavy-duty vehicles



TNO innovation
for life



Shell

Zero Emission Laboratory (ZELab)
(Prof. Bart Somer, Dr. Noud Maes)

Renewable energy cycle enabled by *metals*



methane



iron



aluminum



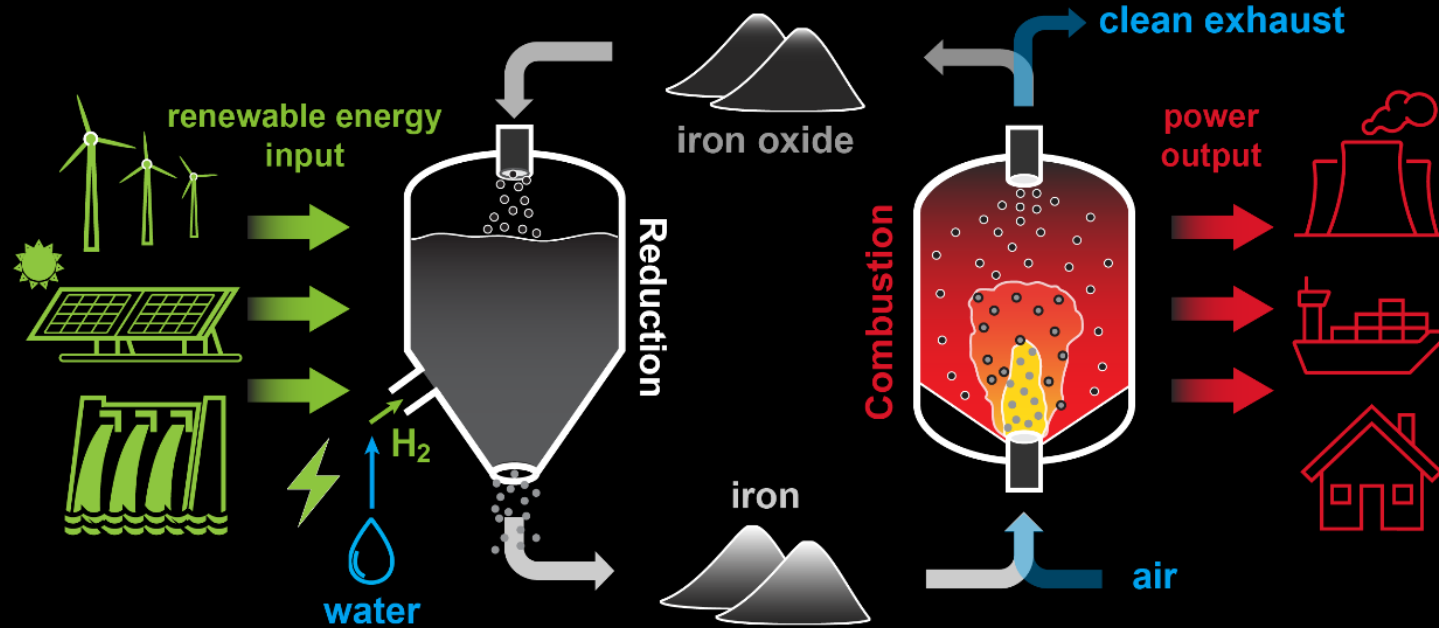
boron/aluminum



zirconium

Metal powders (micron-sized particles) can burn like a gaseous fuel.

Use *iron powder* as a carrier of *renewable energy*



Research on *iron-oxide reduction*
(Prof. Niels Deen, Drs. Yali Tang
and Giulia Finotello)

Research on *iron combustion*
(Profs. Philip de Goey, Jeroen van Oijen,
Benedicte Cuenot, Dr. Xiaocheng Mi)

Use *iron powder* as a carrier of *renewable energy*

Burners of iron powder in laboratory



Student Team collaborating with
the Power & Flow Group



To build industrial-scale combustors:

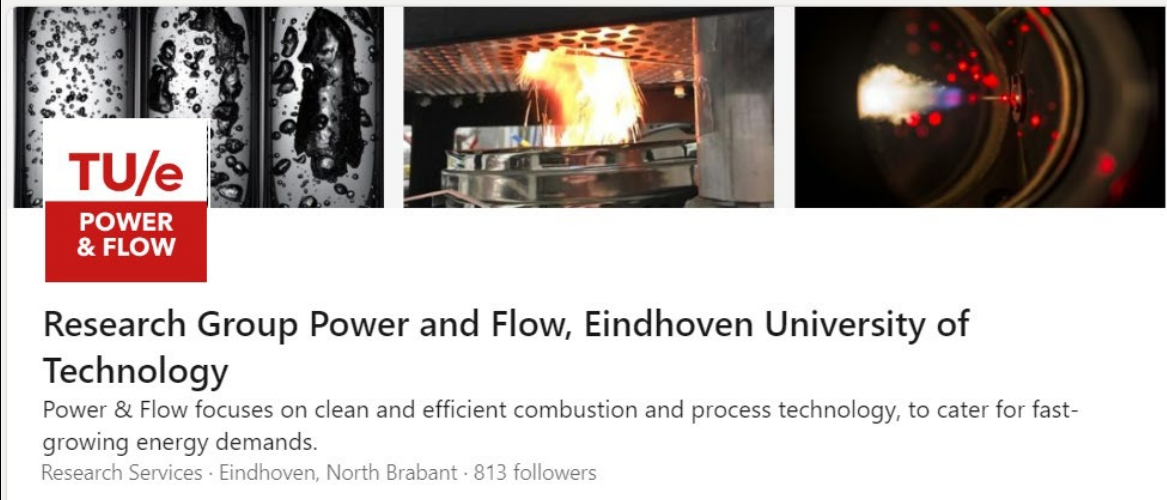
Spinoff



TU/e

To know more about Power & Flow Group

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The banner features three images: a close-up of a turbine component with a red TU/e logo and 'POWER & FLOW' text overlaid; a bright orange flame in a combustion chamber; and a close-up of a turbine blade with red laser dots. Below the images, the text reads: 'Research Group Power and Flow, Eindhoven University of Technology', 'Power & Flow focuses on clean and efficient combustion and process technology, to cater for fast-growing energy demands.', and 'Research Services · Eindhoven, North Brabant · 813 followers'.

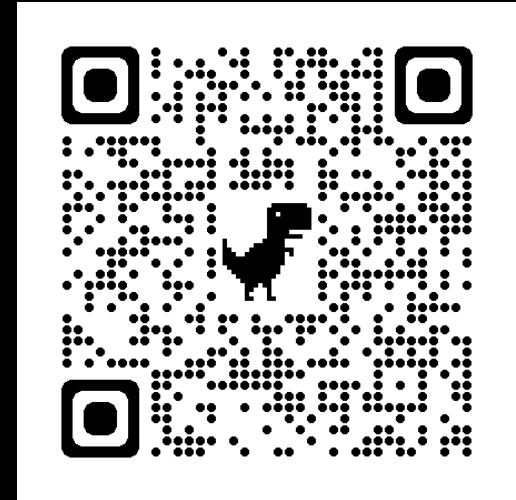
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Research Group Power and Flow, Eindhoven University of Technology

Power & Flow focuses on clean and efficient combustion and process technology, to cater for fast-growing energy demands.

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Or scan the QR code:



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Thank you all for your attention! 😊