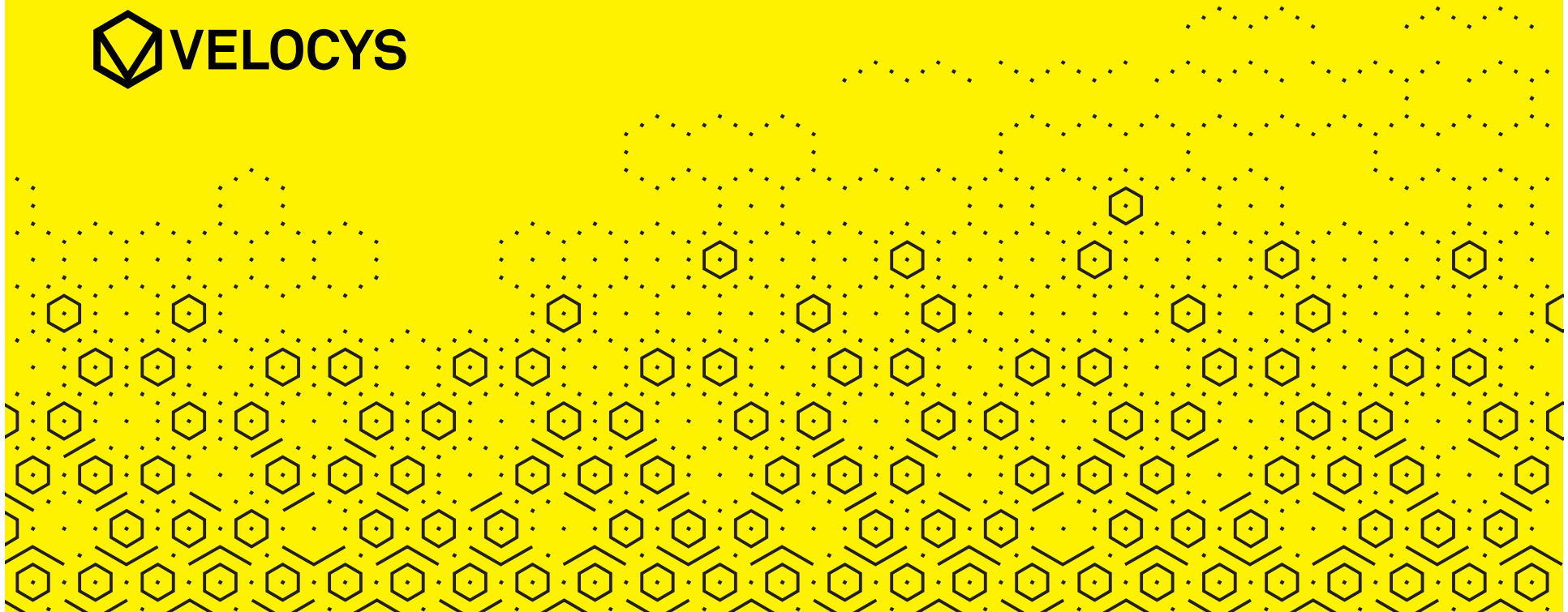


Neville Hargreaves

World Waste to Energy City Summit, 10th May 2016

Waste to sustainable liquid fuels

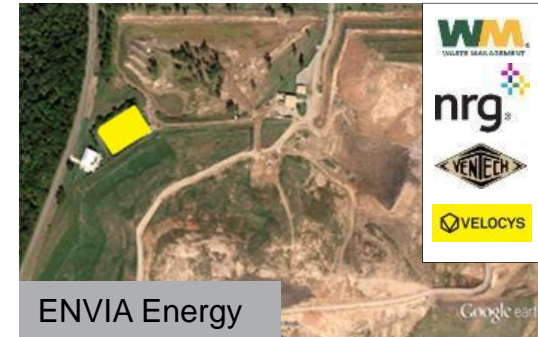
A route to project viability



Velocys

The company at the forefront of smaller scale GTL and BTL

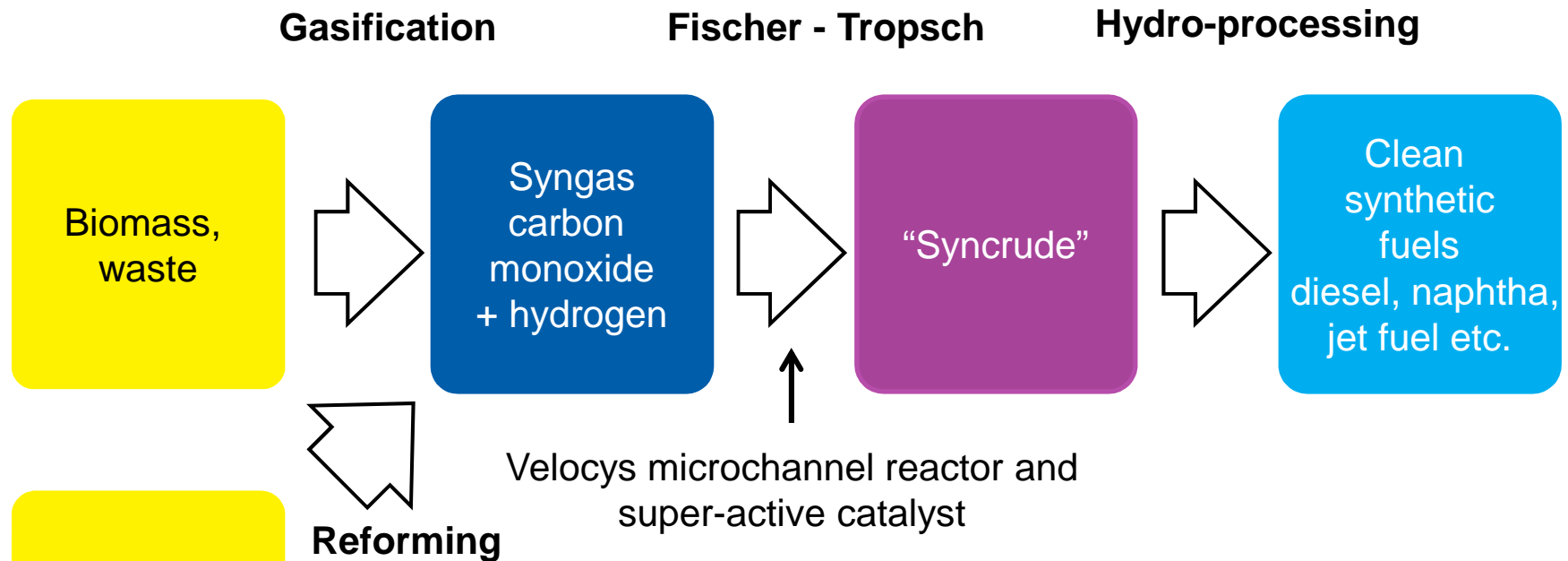
- **Leader** in smaller scale gas-to-liquids technology
 - 15 years and >\$300 million invested in product development
 - Exhaustive and proven patent protection
- **Commercial roll-out underway**
 - Commercial reference plant in Oklahoma City under construction
- **Well capitalised with strong resources**
 - Locations in Oxford, UK; Houston, Texas; Columbus, Ohio
 - Permanent pilot plant in Ohio, USA
 - Operating / engineering expertise



Red Rock
Biofuels

The Fischer-Tropsch (FT) process in context

Biomass-, waste- and gas-to-liquids (BTL, WTL, GTL)



- One of the few ways to deliver airlines' need for sustainable jet fuel
- FT route to jet fuel from MSW **reduces lifecycle greenhouse gas emissions by ~70%**
- **Drop-in replacement** for petroleum-derived fuel

Thinking smaller; using microchannel FT...

...plant scaled to match MSW or biomass collection logistics

Conventional Fischer-Tropsch reactor

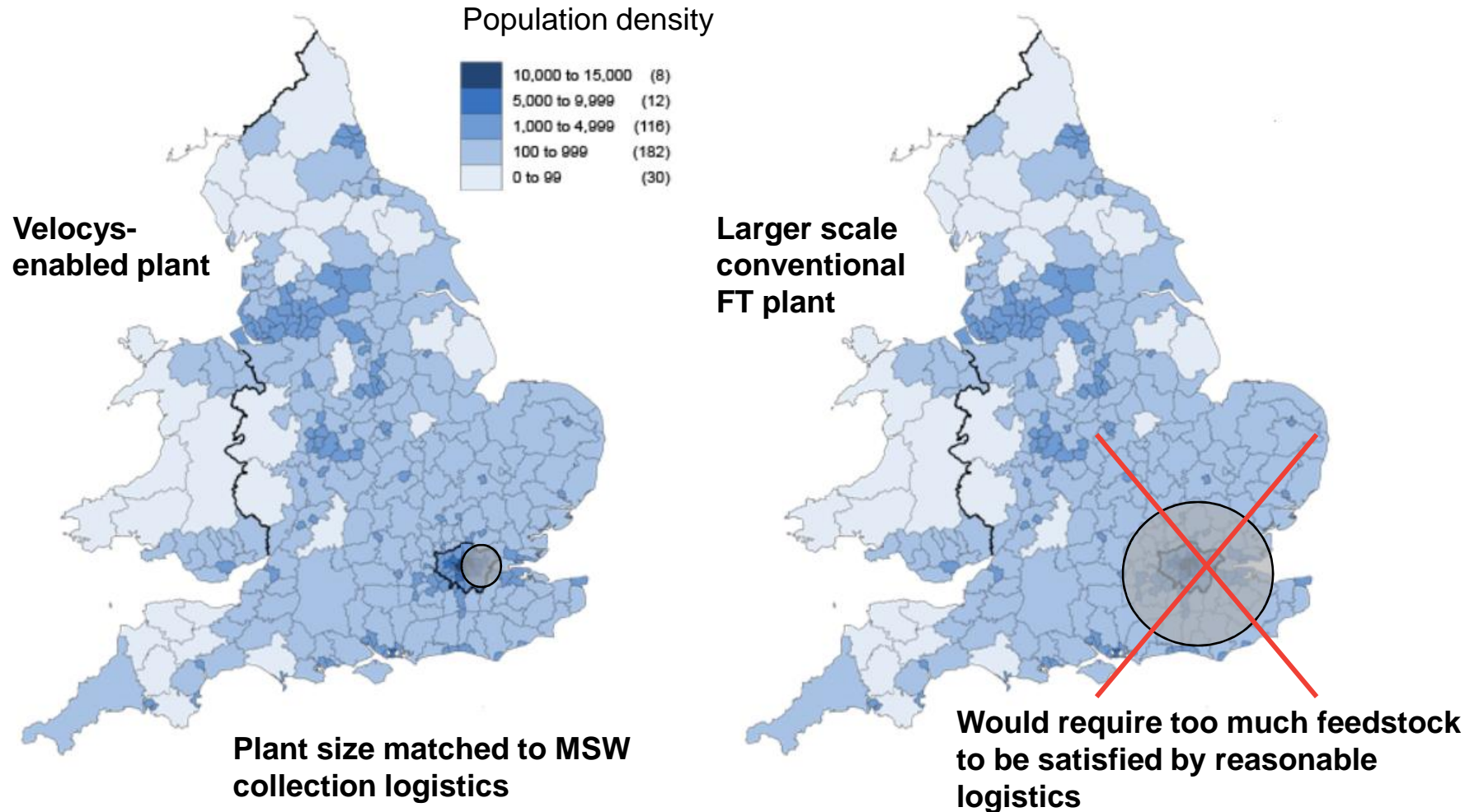


Note: Reactor capacities differ considerably

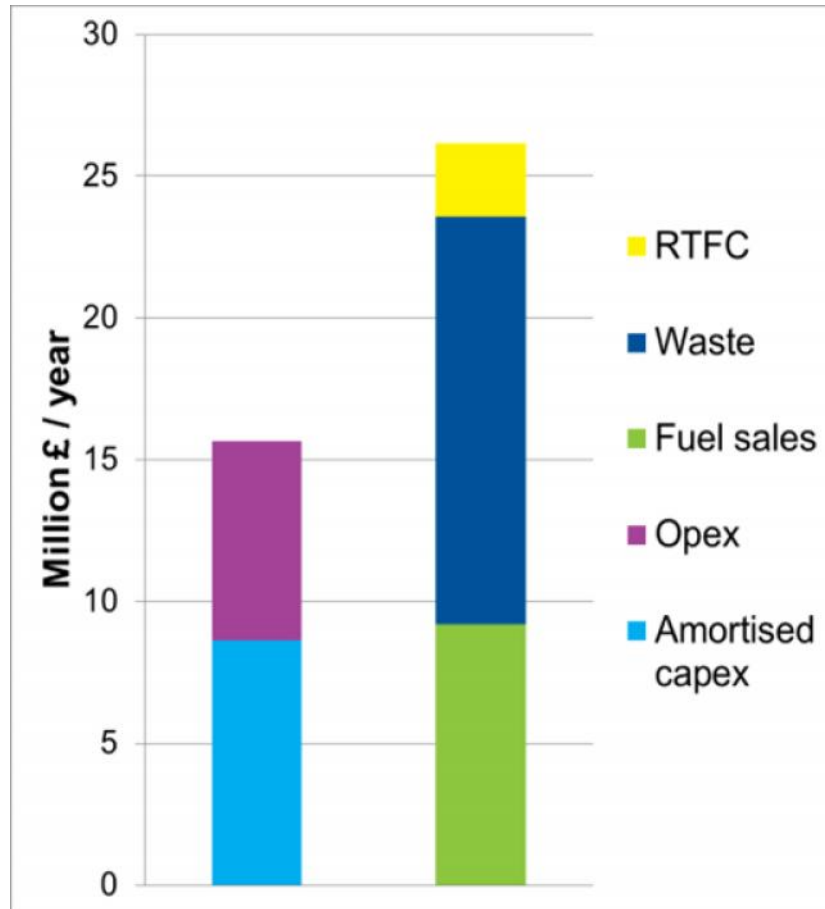
Velocys Fischer-Tropsch reactor

Microchannel Fischer-Tropsch

Plant scaled to match MSW or biomass collection logistics



Waste-to-liquids economics work in tough times



Generic example basis (left)

- 1,000 barrels per day using 200,000 tonnes/yr waste
- Capex \$250 million
- Opex \$30/barrel
- Spot price of fuels Feb 2016
- Waste gate fee £80/tonne
- RTFC 12p per litre diesel

UK WTL plant engineering study

- Velocys developing a project in UK with a major investor
- Initial engineering study in progress by Amec Foster Wheeler

Commercial reference plant under construction

By Ventech and its subcontractors in Oklahoma City



Commercial reference plant under construction

Part of the FT reactor structure



Summary

Smaller scale BTL using FT is now a reality

- Fischer-Tropsch process now **economic at smaller scales**
- Converts low value input into high quality, high value liquid fuels
 - Fulfilling airlines' renewable fuels obligations
- Velocys technology: **ideally suited to BTL and GTL applications**
 - Can be built economically at the appropriate scale
 - **Field demonstrated** in a BTL environment
 - **Selected for Red Rock Biofuels' BTL project**
- **Completion of commercial reference plant** expected mid-year 2016
- Actively pursuing waste-to-liquids opportunity in UK

Contact information



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Think Smaller

