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TS. WOC 14

Think Smaller. GTL is an economic way to monetise stranded gas

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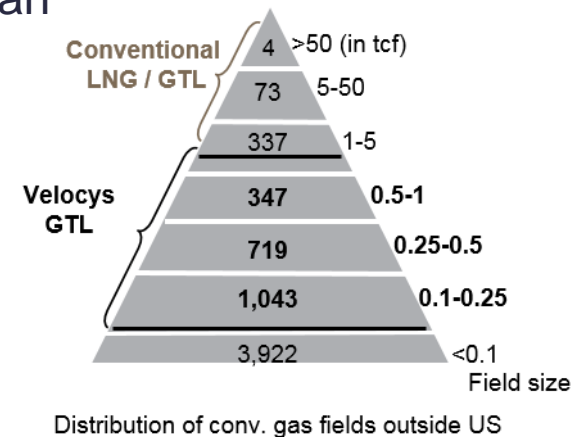
Huge market opportunity

Shale, associated and stranded gas

- Much **shale gas** is distributed scale / remote. Estimated at as much as 3,300 TCF in North America and over 6,500 TCF worldwide (Natural Gas Intelligence / EIA)
- 4.9 TCF of gas flared every year + 6.5 TCF reinjected to avoid **flaring** alone (World Bank)
- Only 5% of the world's conventional **stranded gas** fields can be monetised by large scale GTL / LNG; distributed scale could unlock up to 50% of remaining fields (IHS)

- Distributed scale GTL opportunity size

- Unconventional gas*: 18 million bpd
 - Associated gas: 2.7 million bpd
 - Stranded conventional gas*: 4.8 million bpd
- >25 million bpd**



* Assumes monetisation over 100 yrs

Smaller scale GTL for stranded gas

From low value gas to high value fungible products

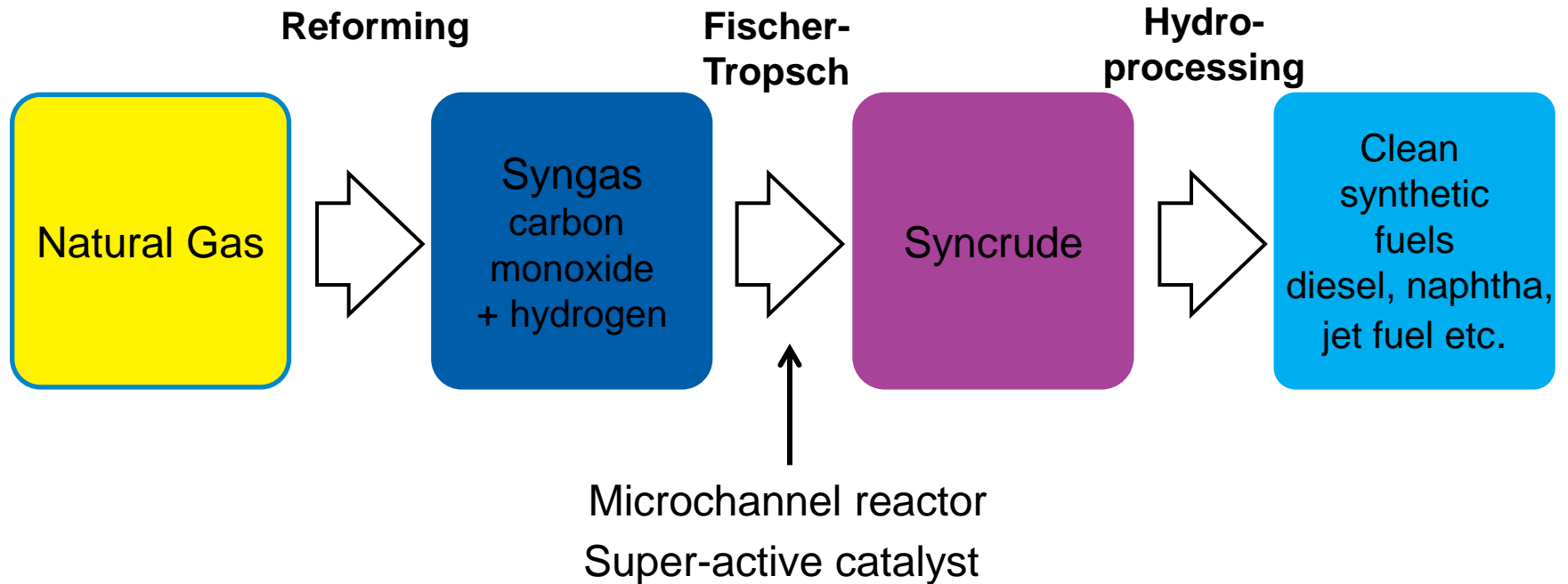
- **Gets stranded gas to market**
 - Where no gas pipeline exists
 - Where producer has no access to pipeline
- **Produce liquid fuels for isolated markets**
 - Local diesel prices can exceed \$1000 per tonne
- **More choices for producers**
 - Diversify from gas into oil pricing
 - Access global markets

To convert low value gas resources to high value liquid products

- Using smaller scale GTL
- Many applications
 - Upstream
 - Midstream
 - Downstream
- Economic route to market for **stranded gas**
- Solution to problem of **associated gas**
- Co-location with refineries
- **Valuable products** for existing and new applications
 - Ultra low-sulphur diesel & jet
 - Waxes, lubricants and solvents



The GTL process



The historical face of GTL

Mega-scale projects

Conventional Fischer-Tropsch reactor





Think Smaller™

Smaller is bringing GTL to the mainstream

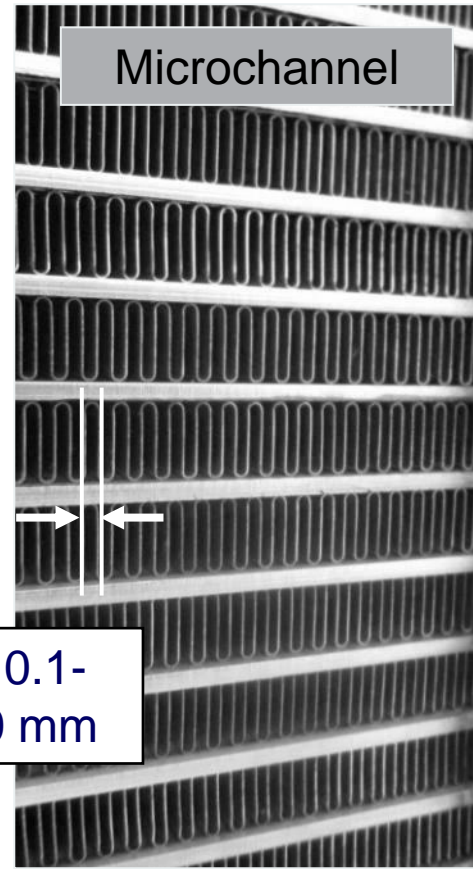
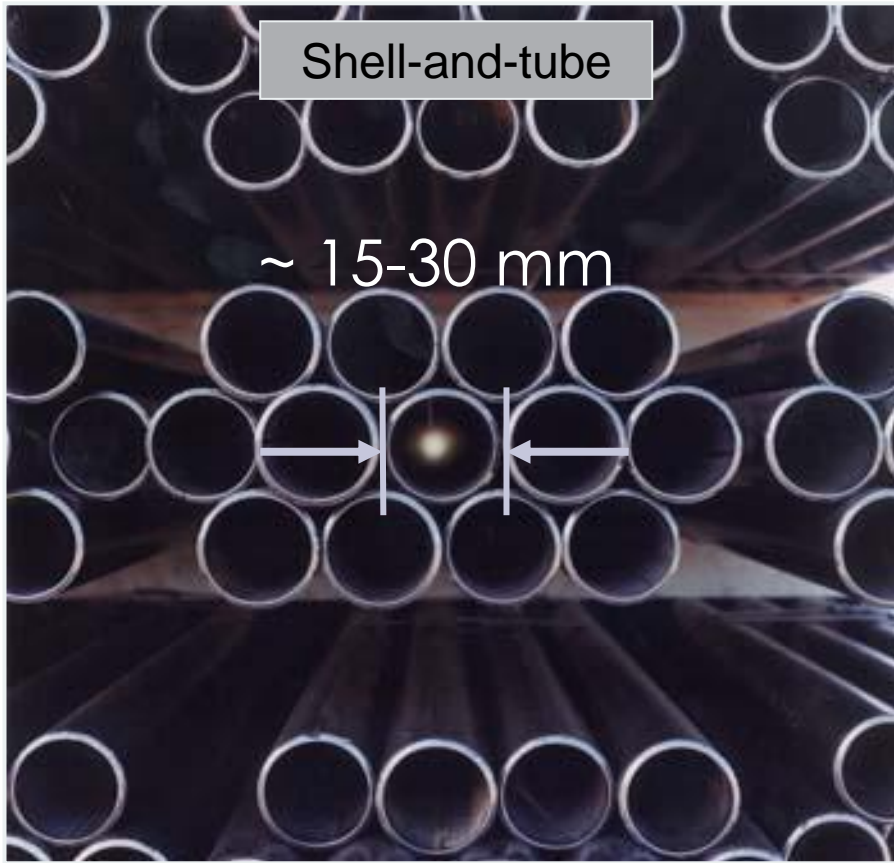
Conventional Fischer-Tropsch reactor



Velocys Fischer-Tropsch reactor

Large-scale economics at smaller scales

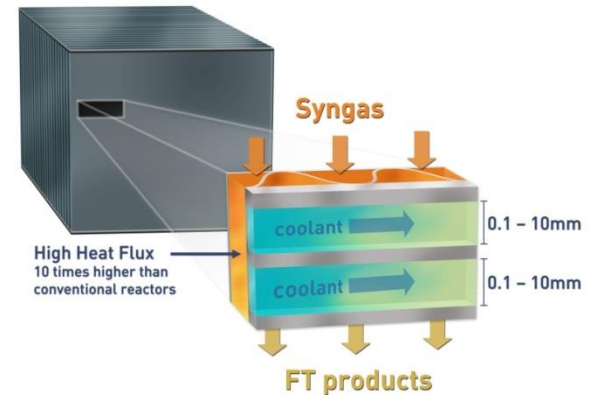
Velocys enables smaller plants



Velocys microchannel technology

Compact, robust, efficient and economic

- Principles of design and operation
 - Particulate catalyst in small channels
 - High catalyst volume fraction
 - Syngas downflow, products exit bottom
 - Coolant water / steam generation
 - Heat removal by steam generation
- Strengths
 - High per pass conversion (74-75%)
 - Isothermal behavior – thermally stable
 - Robust to upsets
 - Strong economy of mass manufacturing
 - Accommodates high activity catalysts
 - Installed spares relatively cheap
 - High on-stream factor
 - Tail gas recycle only to achieve high conversion
 - Extremely high volumetric productivity
 - Ease of modularisation



FT reactor core



Commercial FT reactor



Think Smaller means...

Nothing wasted

Smaller scale GTL makes the most of the resources available

- Convert undervalued gas into higher value liquid fuels
- Unlock stranded or associated gas
- Produce oil without flaring gas
- Use any type of gas available



Better options

Smaller scale GTL offers more companies access to higher value markets

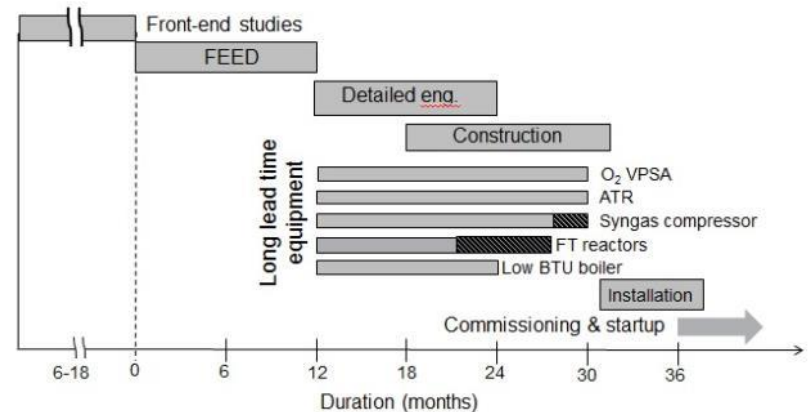
- Creates opportunities for producers to diversify and increase revenues
- Choose from a range of high value products
- Greater breadth of customers, locally and globally
- Smaller, lower cost plants need less gas to be profitable (e.g. 15 mmscfd)



Moving faster

Smaller scale GTL realises profits faster

- Shortens the time between concept and being operational
- Build plants where the opportunity is – even in remote areas
- Accesses markets faster – no need for pipelines
- Enables products to be sold locally

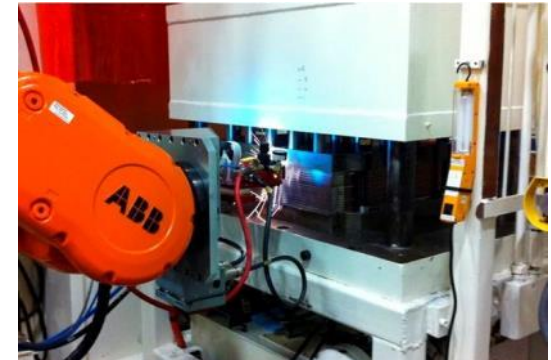


Velocys smaller scale GTL...

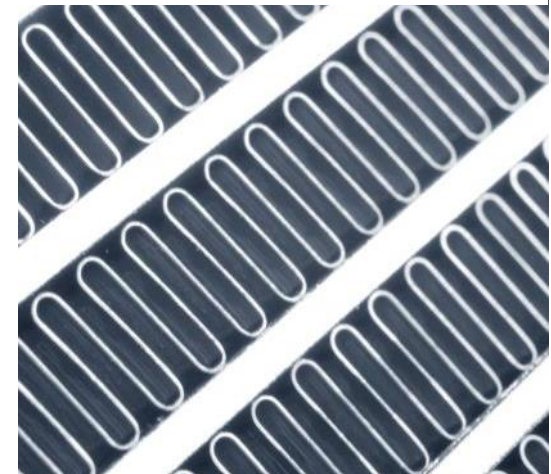
Improves the economics

Our design leverages standardisation, unlocking opportunities that were previously uneconomic

- Typically from 1,500 to 15,000 barrels per day (15 – 150 mmscfd)
- Our design is specific for smaller scale plants, not just a scaled down large plant
- Our components are standardised, reducing costs
- Our strategic partnerships allow us to deliver at volume



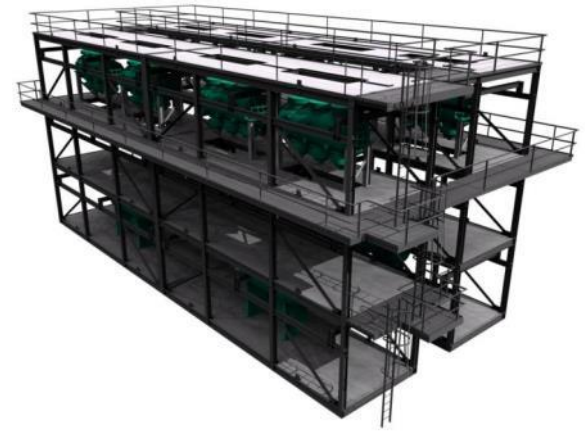
Reactor manufacture



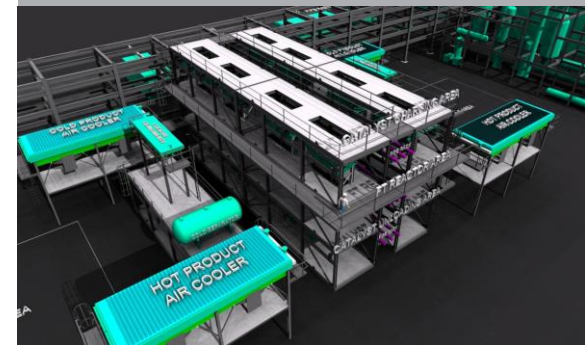
Works anywhere

Our plants are modular, so they are easier to ship and easier to install, even in the most remote or challenging locations

- Velocys reactors are significantly smaller and lighter than conventional technology
- 70% of a plant can be factory-built before installation
- Modular components fit in standard containers for ease of shipping
- Building is fast, we have reduced the risk of delays, and plants can even be integrated with existing facilities



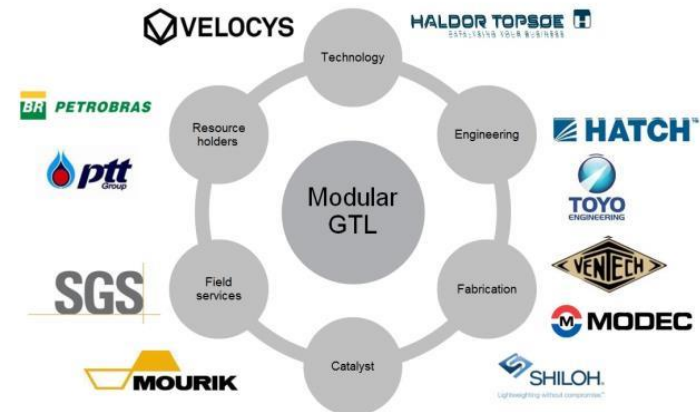
1,400 bpd FT process unit
designed by Ventech Engineers
27m L x 14m H x ~12m W



Works for anyone

Velocys unlocks more business by working flexibly – allowing companies to capitalise on more opportunities

- Smaller projects means more opportunities, accessible to more companies
- We have strong partnerships with key players throughout the value chain
- Velocys can support all aspects of project development and execution



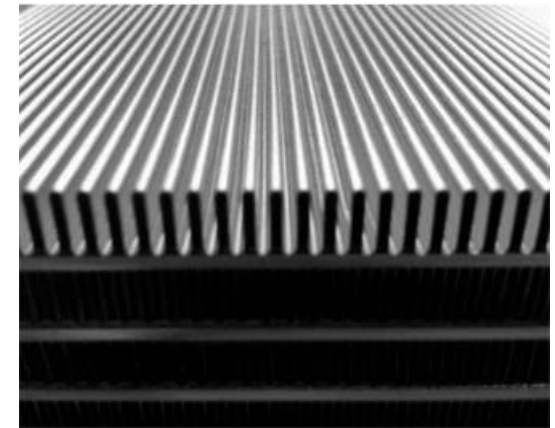
Supply chain

Shiloh – ramping up for mass production

- Implementing multi-million dollar state-of-the-art production cell at chosen supplier
 - Cost effective mass production
 - Consistent high quality
 - In place by year end
 - Supply chain infrastructure currently designed to scale-up & deliver on orders up to **10,000 bpd/yr**
 - Growth plans in place to double capacity in <12 months
- Production cell is replicable and scalable
 - Cost effectively
 - Lead-time within plant order duration
- Expected lead times are <12 months



Reactor manufacture



Designed for production

But what about the oil price?

- The low oil price will hit mega-scale GTL projects disproportionately
 - These cannot be sited at the most advantaged locations
- Proposed GTL projects focusing on fuel production whose rationale was to take advantage of the gas arbitrage at major hubs will undoubtedly be more difficult to progress at present
- But there are still many “special cases” – local opportunities that retain their value because an advantaged arbitrage exists:
 - That utilizes economically-priced gas or other low cost feedstock
 - That produces high-value specialty products
 - That serves isolated areas where liquid fuel importation costs are very high





Commercial reference plant under construction

Updates on other commercial projects

Commercial plant under construction

- Construction of a commercial GTL plant underway
 - Adjacent to Waste Management's East Oak Landfill in Oklahoma City, USA
 - Using a combination of landfill gas and natural gas
- JV (ENVIA Energy) between Waste Management, NRG Energy, Ventech Engineers and Velocys
- Will provide a commercial reference plant for the Velocys technology
 - Will deploy a number of full scale Velocys FT reactors
- Entered all major contracts, procurement of all major equipment completed, fabrication of reactors and plant modules underway
- Commercial operation expected H1 2016



Developing in-house project development capability

- Velocys selected by the developer of Ashtabula GTL in September 2013 as FT technology provider
- This leading project developer of smaller scale GTL in North America was acquired by Velocys in 2014
 - Houston-based
 - Project team now operates **as part of Velocys (Velocys Project Solutions)**
 - **Portfolio of sites under development** across North America
 - **First project will be 4,200 bpd GTL plant** in Ashtabula, Ohio, USA
 - First phase of a **10,000+ bpd facility**
 - Substantial **existing infrastructure enhances economics** at site
- FEED work underway; air permits being resubmitted for larger plant size
- FID targeted end 2015
- Velocys **technology remains fully available** for license to others



Red Rock Biofuels

US DoD sponsored BTL

- Velocys selected for **1,100 bpd** biomass-to-liquids (BTL) plant
 - Located in Oregon, USA
 - Using forestry waste feedstock
- Supported by US Department of Defense and US Department of Energy
 - Received \$4.1m phase 1 grant for engineering in July 2013
 - FEED study complete
 - **Received a \$70m construction grant** in September 2014
- Targeting final investment decision H1 2015
- **Southwest Airlines to offtake** 3 million gal/yr of aviation fuel from the plant



GreenSky London

Renewable jet fuel in London

- Velocys selected by Solena Fuels as FT supplier for commercial **2,500 bpd** waste-biomass-to-liquids plant
- GreenSky London plant in partnership with **British Airways**
- **Competitive selection** process after technology evaluation advised by **Fluor**
- **BA** to provide off-take for jet fuel
- Pre-Front End Engineering completed
- **Site selection** announced April 2014
 - Site of former Coryton oil refinery in Thurrock, Essex, UK



Picture courtesy of British Airways

Velocys – at the forefront of smaller scale GTL

- Even with the current oil price there are **many project opportunities** for smaller scale GTL projects
- **Velocys, the company at the forefront of smaller scale GTL technology**
 - 15 years and >\$300 million invested in its unique innovative technology
 - Exhaustive global patent protection (>7,600 granted GTL claims)
 - **Broad & deep in-house capabilities.** With first class partners will deliver a complete GTL solution
- **Commercialisation underway**
 - ENVIA Energy Oklahoma City, Ashtabula, GreenSky/BA, Red Rock Biofuels

Thank you

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Appendix



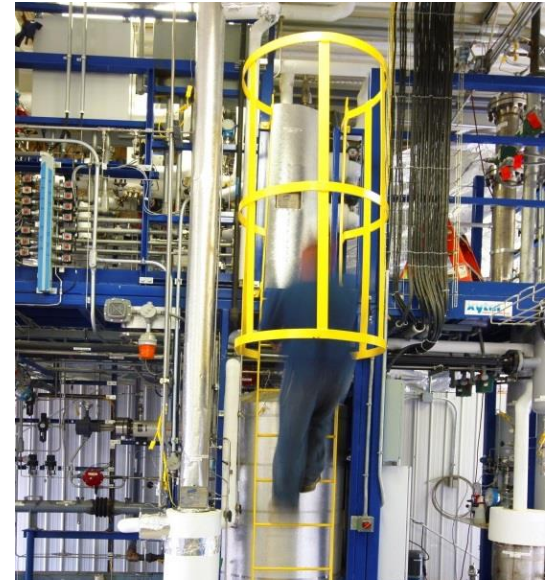
Velocys

In-house capabilities

Pilot plant and training facility

Supporting sales and delivery

- Integrated GTL pilot plant at the Velocys Ohio, USA site
- Provides
 - Performance data to support differing client designs
 - Product for client studies
 - Permanent training facility for plant operators
- Platform for
 - Developing our own field support staff
 - Demonstrating future product generations

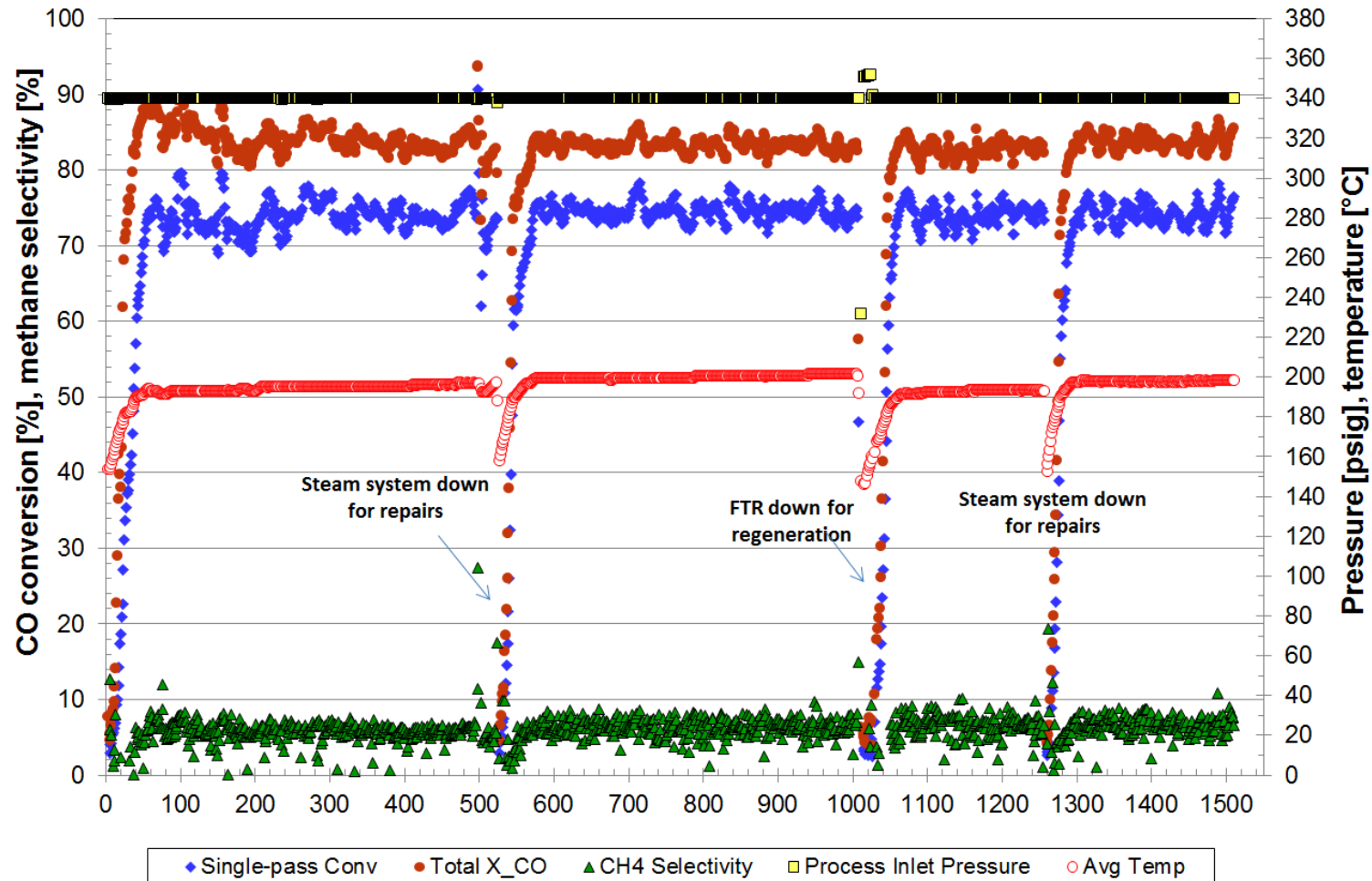


Pilot plant



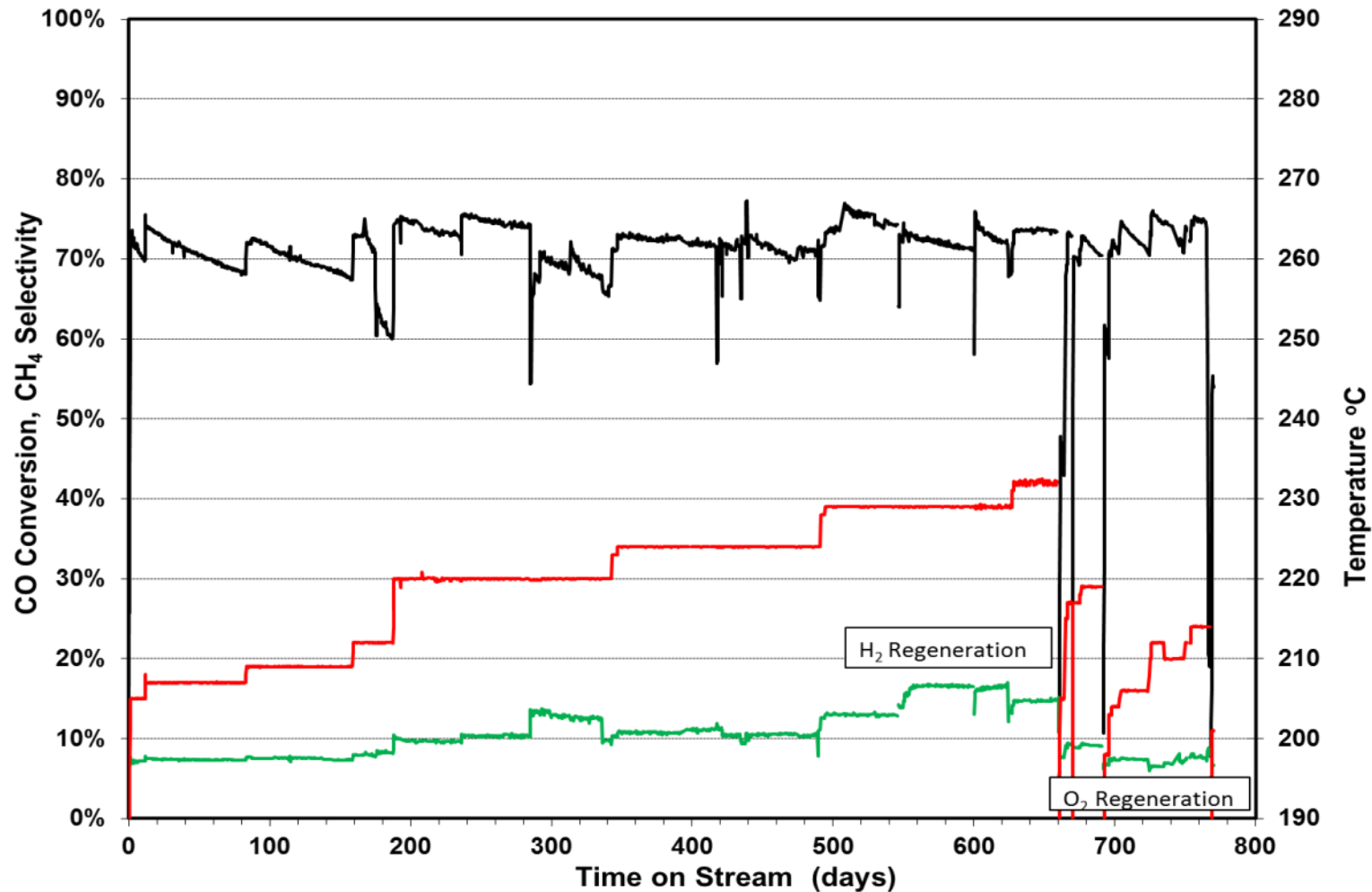
Velocys pilot plant

1,500+ hours of successful operations at commercial conditions



Exceptional FT catalyst stability

Operated for nearly 2 years without regeneration



Velocys – the company at the forefront of smaller scale GTL

- **Leader** in smaller scale gas-to-liquids technology
 - 15 years and >\$300 million invested in product development
 - Exhaustive global patent protection (>7,600 granted GTL patent claims)
- First class **partners** offering a **complete GTL solution**
 - Haldor Topsøe, Ventech, Hatch, Toyo, Mourik, SGS, Shiloh
- **Commercial roll-out underway**



- **Well capitalised** with **strong resources**
 - Commercial center in Houston, Texas; technical centers near Columbus, Ohio and Oxford, UK
 - Permanent pilot plant in operation

Resource build-up

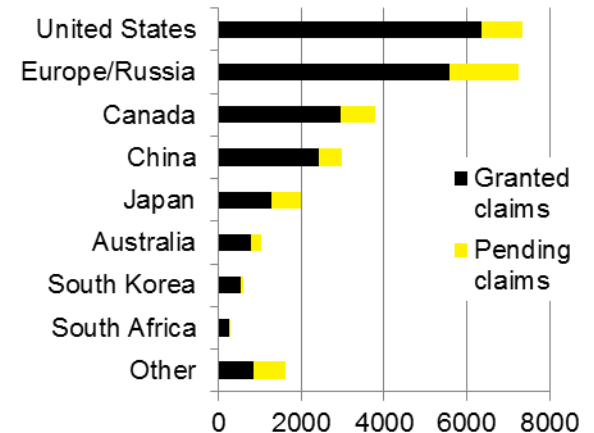
Rapid growth at the company's commercial centre



Intellectual property

Largest IP position of its kind

- **World's largest** microchannel patent portfolio
 - >26,000 claims in >900 patents
 - 75 patents granted in 2013
 - Over half of patents cover GTL
- **High quality**
 - IP cited over 3,000 times in others' patents
 - 100% success rate to date defending challenges / re-exams of own patents
- IP portfolio has **years to run** – continually being renewed and extended
- Pursuing infringers; **won UK High Court case** and **injunction** against CompactGTL



Number of patents expiring

