

Sustainable growth  
for the renewing industry  
with VTT's investments

Digital development platform  
for biosynthetic materials

# Five research investments and a national initiative

1

Pure and stable heat in cities: Domestic district heating reactor operational in 2030

2

New piloting platform bringing solutions for the recycling challenge of plastics and textiles

3

A pilot environment for fibre products to significantly reduce energy and water consumption in the forest industry and enable new product innovations

4

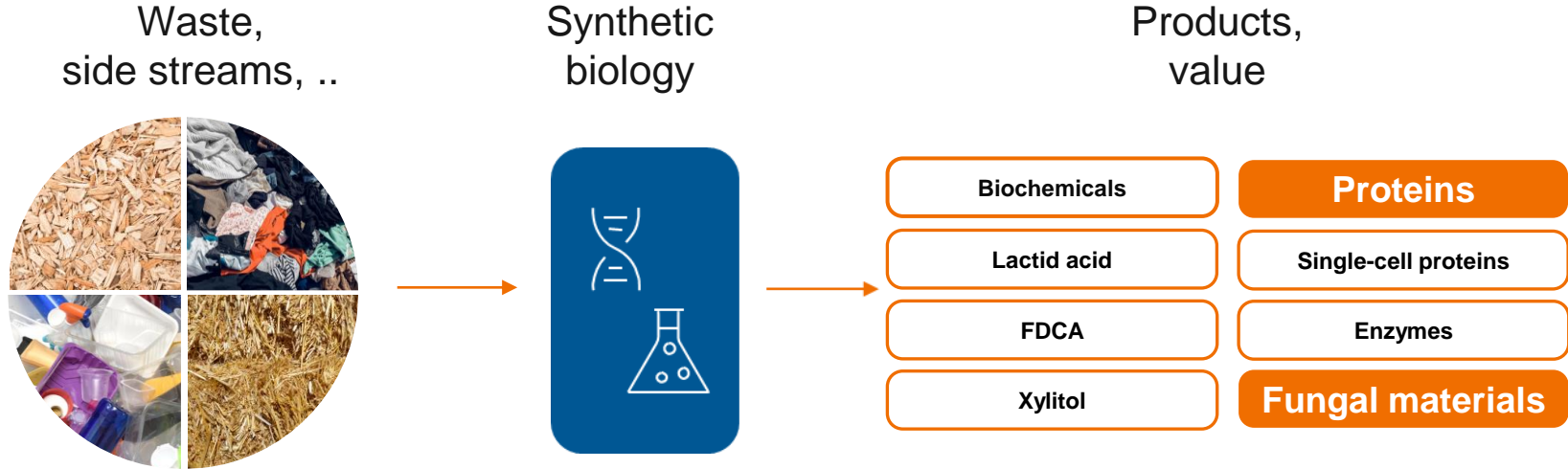
Digital development platform for biosynthetic materials: New materials by natural means 10 times faster

5

Piloting environment for medical devices

Initiative to build piloting environment: Finland as leading RDI cluster in microelectronics and quantum technology

# Synthetic biology enables turning diverse raw materials to valuable materials and products



## SUSTAINABLE RAW MATERIALS

# SynbioMAP: platform for biosynthetic materials

- **Platform and methods** for the systematic development and optimisation of **biosynthetic materials** and their manufacturing for e.g. bioplastics, textiles
- Combines data-based and Artificial Intelligence methods to biosynthetic materials development to design solutions up to 10 times faster.
- Producing renewable feedstocks and completely new materials that are smart, responsive and optimised for life-cycle.
  - Sustainable materials optimised for life-cycle
  - Completely new, superior, smart and responsive materials
  - Developed faster than before

# SynbioMAP

**Superior biosynthetic materials**

**developed 10 times faster**

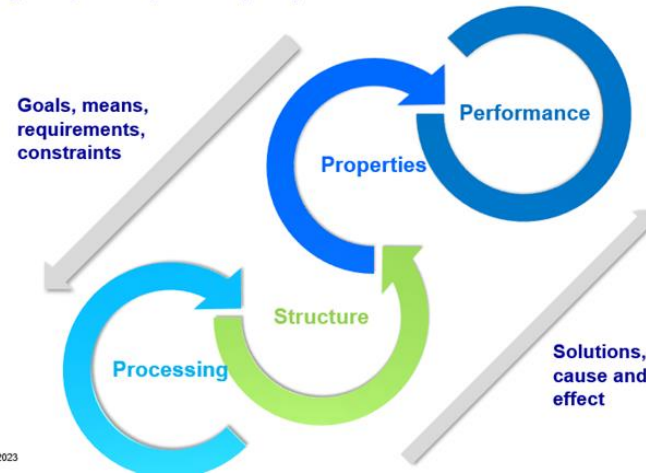
Organism development and selection  
Process development  
Scale-up and piloting



**VTT's bioreactor facilities to**

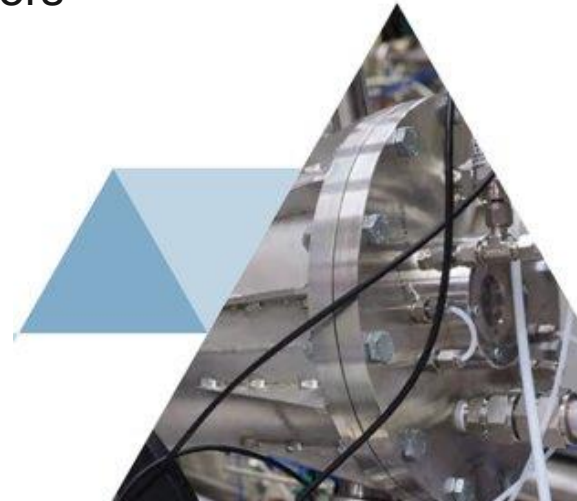
explore strain physiology, benchmark strains and processes, screen production hosts, test production concepts, provide input to techno-economic models, assess scale-up problems and provide pilot facilities.

VTT ProperTune®

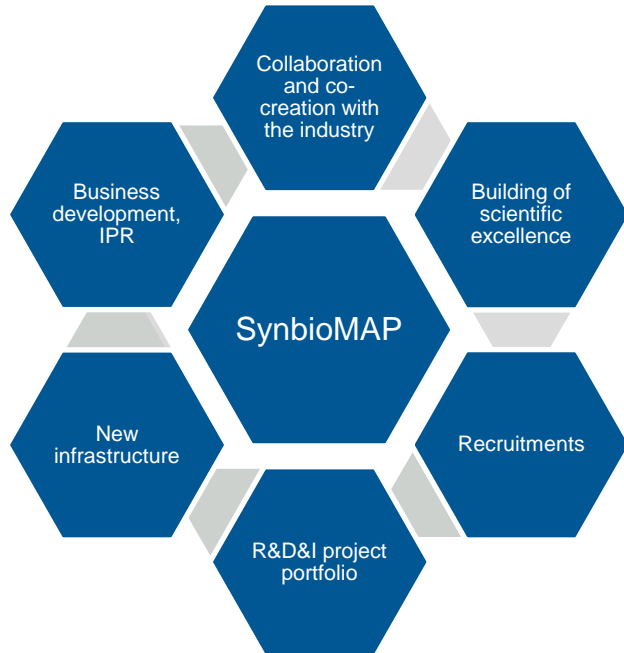


# Building excellence

- putting the scientific disciplines together
- new recruitments
- PhD and post doc activities with academic partners and companies
- R&D funding applications targeting to excellence development
- strengthening links to national and international partners



# SynbioMAP research investment program 2023-27



# Responsive future materials

- First focus on materials suited for the virtual design cycle and high throughput biosynthesis such as
  - Novel bioplastics with improved barrier and mechanical properties
  - Protein based elastic fibers and scaffolds with tuneable mechanical properties and responsiveness
  - Applications in e.g. textiles, bioplastics
- Future focus to be defined according to the interest of the participating companies





# Building with companies

## Industry engagement to

- understand their expectations
- focus on applications and materials with best business potential.
- validate market assumptions
- identify potential IP risks.
- extend VTT network of potential customers.

## Target industry

- biomedical/pharma
- plastics/packaging manufacturers
- textiles manufacturers, clothing/homewear consumer brand
- coatings
- industrial side-stream producers



# bey<sup>0</sup>nd

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