VTT in brief:
We create sustainable growth by tackling global challenges
VTT today

2,049 employees
36% of Finnish innovations have links with VTT's competences
44% of turnover from abroad*
363 patent families

VTT is under the state ownership steering of the Ministry of Economic Affairs and Employment

171 M€ Turnover (parent 160 M€)
26 M€ Other operating income
71 M€ Government grant

EUR 268M

*VTT Group 2018
Innovations emerge from collaboration

- Tailored partnership
- Joint projects
- Innovation ecosystems
We turn science into practical innovations through applied research
We make an impact through science and technology

Our vision
A brighter future is created through science-based innovations.

Our mission
We help our customers and society to grow and renew through applied research.

Our strategy
We make an impact through scientific and technological excellence.
VTT earlier work
The Relooping Fashion Initiative

VTT earlier work
The Relooping Fashion Initiative

First phase
2017-2019
Telaketju R&D action and network

Telaketju Action

- **Telaketju YM 2017-2018**
  - Jointly funded project, total budget 205 k€
  - Topics: Collecting, sorting and pre-processing
  - Coordinator Lounais-Suomen Jätehuolto (municipal waste management organization in Southwest Finland)
  - Participants: Municipalities, recycling organizations, public participants, as well as charities.

- **Tekes**
  - Business Finland
  - Telaketju Tekes, 2017-2019
  - Jointly funded project, total budget 2.67 M€
  - Topics: R&D for processes, products, services aiming for business and export markets
  - Coordinator VTT
  - Participants: Turku and Lahti Universities of Applied Sciences and Companies

- **Telaketju TEM & AIKO 2018-2019**
  - Topics: Investments and markets & business planning
  - Beneficiary: Lounais-Suomen Jätehuolto
Telaketju YM and Tekes projects

Examples of results of jointly funded Telaketju YM and Tekes projects

Textile collecting trials: reusable and textile waste

Identification and sorting: Manual and NIR studies

Sorting and property requirements of textile waste materials for different recycling processes

Heikkilä P. et al., Telaketju - Towards Circularity of Textiles, VTT Research Report, VTT-R-00062-19
Examples of results of jointly funded Telaketju YM and Tekes projects

- Ring-spun yarn and knitted material, VTT (TUT)
- Composite materials, VTT
- Towels, Finlayson
- Packaging materials, Paptic
- Packaging materials, Paptic
- Regenerated cellulose fibres, Infinited Fibre Company
- Nonwovens, Suominen
- Acoustic panels, Soften
- Composite furniture, Touchpoint

Heikkilä P. et al., Telaketju - Towards Circularity of Textiles, VTT Research Report, VTT-R-00062-19
Second phase
2019-2021

Public Telaketju 2 Business Finland project
Coordinated by VTT

Activities related to Refinement plant
Lounais-Suomen Jätehuolto Oy (LSJH)
Telaketju 2 BF project

**Targets** to build business from circular economy of textiles

**Scope** of the project includes:

- novel circular economy business models aiming for better material efficiency and increase material and product life
- business related to textile recycling

**Project details**

- Coordinator: VTT Pirjo Heikkilä (pirjo.heikkila@vtt.fi, +358 40 6891443)
- Co-Innovation project of Business Finland (BF)
- Duration two years: 1.5.2019 - 31.4.2021
- Finances on next slides
Telaketju 2 BF project

Projects including total budgets (k€) and share (%)

- VTT; 699; 14%
- Turku UAS; 218; 5%
- Lahti UAS; 217; 4%
- Public R&D project
  Total 1134 k€; 22%

Company projects; 3808; 77%
Lounais-Suomen Jätehuolto
Touchpoint
Pure Waste textiles
Image Wear
Telaketju 2 BF project

Funding (public part) including total (k€) and share (%)

- Business Finland; 681; 60%
- Companies and other organizations; 158.5; 14%
- Lahti UAS; 57; 5%
- Turku UAS; 57; 5%
- VTT; 182; 16%

- Aijuu
- Black Moda
- Freudenberg
- Globe Hope
- Infinited Fibre Company
- Kangaskapina
- Kehräämö Mustalammas
- Kuumeri
- Mirka
- Lounais-Suomen Jätehuolto
- Nosh Company
- Paptic
- Porin Villa ja Peite
- Reima
- Sideflow
- Topper
- Vaatepuu
- Valmet

- Fida
- Nextiili
- Painovoimapaja
- PK-seudun kierrätyskeskus
- Suomen Tekstiili & Muoti
- Työn Vuoksi ry
- Verstas 247
Telaketju 2 BF project
Telaketju 2 BF project

Circular economy

- Business Models (WP2)
- Products and materials (WP3)
- Recycling (WP4)
- Sustainability (WP5)
- Quick trials and demos (WP6)
- Consumers (WP7)
- Management & networking (WP1)
- Dissemination & ecosystem (WP8)
Telaketju 2 BF project

**WP1 Management and networking**
We aim to build and strengthen circular ecosystem of textiles by networking both nationally and internationally.

Led by VTT

**WP2 Business models**
Novel circular business models will be studied and developed, and companies are provided with tools communicating about circular solutions within their value chain.

Led by Turku UAS
Telaketju 2 BF project

WP3 Products and materials
We will review effect of product design on material and products life span and recyclability, integrated product information in circular economy, as well as bio-based solutions for textiles.
Led by Lahti UAS

WP4 Recycling
We develop concepts for textile collecting and pre-sorting, textile identifying and sorting systems, and draft a classification system of recycled textile materials.
Led by VTT
Telaketju 2 BF project

**WP5 Sustainability**

*Environmental, social and economical sustainability* are promoted in our project. We will review different tools for LCA and social costs calculation, make modeling of costs of textile recycling and study market potential of different solutions.

Led by Turku UAS

**WP6 Quick trials and demonstrations**

Participants of project represent various stakeholders in circular economy, which enables us to make *fast experiments* with novel business models, as well as *demonstrate* processes and products thus modelling future recycling value chains.

Led by VTT, company involvement strong
Telaketju 2 BF project

**WP7 Consumers**
Consumers needs to be involved in circular economy of textiles and therefore we study consumer attitudes and direct our communication activities also to common public.

Led by Turku UAS

**WP8 Ecosystem**
We aim to increase business opportunities also by supporting ecosystem building, and review scalability and export potential of results as well as further development and research needs.

Led by VTT
Telaketju takes Finland towards circularity of textiles

Telaketju’s success factors

• Strong company involvement – aiming for business, but just making project work
• Involving whole value network – different types funding to involve also non-profit organizations into research work and thus into building of circular textile ecosystem
• Focus on applied research e.g. demonstrations – practical solutions close to market
• Long term commitment from companies, R&D and funding agencies
• Effective co-operation via open communication & trust between participants
• Motivated individuals forming innovative group – more than just a sum of individuals
• Optimistic project group – circular economy transformations will change textile sector, but it provides new opportunities for those who are ready to change
• Connections with stakeholders including, ministries, other projects, other companies, education, etc… and the general public
More information about Telaketju and projects [www.telaketju.fi](http://www.telaketju.fi) and [pirjo.heikkila@vtt.fi](mailto:pirjo.heikkila@vtt.fi)

Thank you! Questions!