Boosting bioplastic innovations

Plastics in Carbon-neutral and Biocircular Economy, 16. Dec 2020 Lahti

CEO, Dr. Sauli Eerola, Muovipoli Oy

Muovipoli Oy

Established in 1999 as development center of plastics industries in Finland

Public-private-owned, 26 shareholders:

- 4 universities (Aalto, Tampere, Helsinki, LUT)
- 13 industrial companies (Borealis, Bayer, Uponor, Wipak etc.)
- Finnish Plastics Industries Federation, City of Lahti, development organisations etc.

Main services: R&D services, testing services, material audits

R&D, testing and processing services

ISO 9001
BUREAU VERITAS
Certification

- Main focus on thermoplastics and thermoplastic composites
- Materials and application-based R&D
- Business/product idea evaluation, feasibility studies
- Project services (project plans, financing applications and contacts)
- Material and technology selection

Plastic testing laboratory with standard conditions 23°C RH 50 %

- Tensile, compression and flexural testing (-70-+300 °C)
- Charpy impact testing
- Rheological properties
- Density measurements
- Ring stiffness
- Moisture content measurement
- Filler content measurement by ashing
- Color measurements
- Hardness measurements (Shore A/D, Brinell)
- Friction testing
- Ball drop impact testing for film and sheets
- Tear resistance test for films
- Environmental stress cracking resistance ESCR
- DSC, TGA, FT-IR
- Etc.

Processing: Injection moulding , extrusion (blown film, sheet, filament), compounding, granulating, thermoforming

Drivers for bio- and circular economy

Global market drivers

Climate change

Carbon neutrality

Global waste management challenges

Changes in attitudes and consumer behaviour

Public discussion (Ellen MacArthur Foundation etc.)

Public steering

Development of bio- and circular economy

Ecosystems, knowledge, business models

Developments in properties, functionality, quality, availability and prices of circular and biomaterials

EU Regulation

CEP Circular economy package incl.

A European strategy for plastics in a circular economy

SUP Single-use plastics –directive

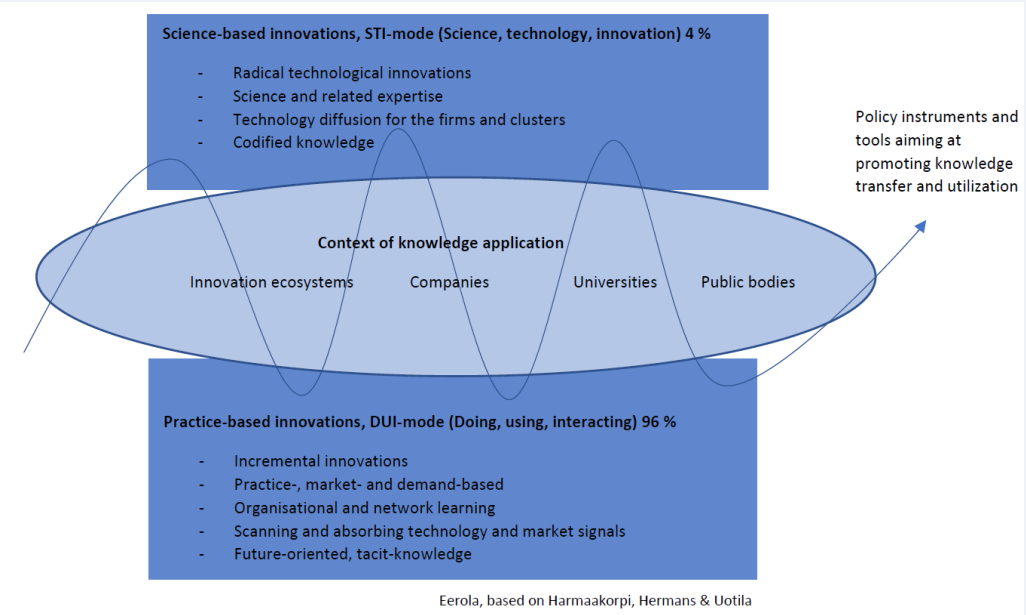
Etc.

A Plastics Roadmap for Finland

10 key actions and several measures

A key action: Invest in a big way in alternative solutions and set up a New Plastics knowledge network

Industry and innovations



Eerola, based on Harmaakorpi, Hermans & Uotila

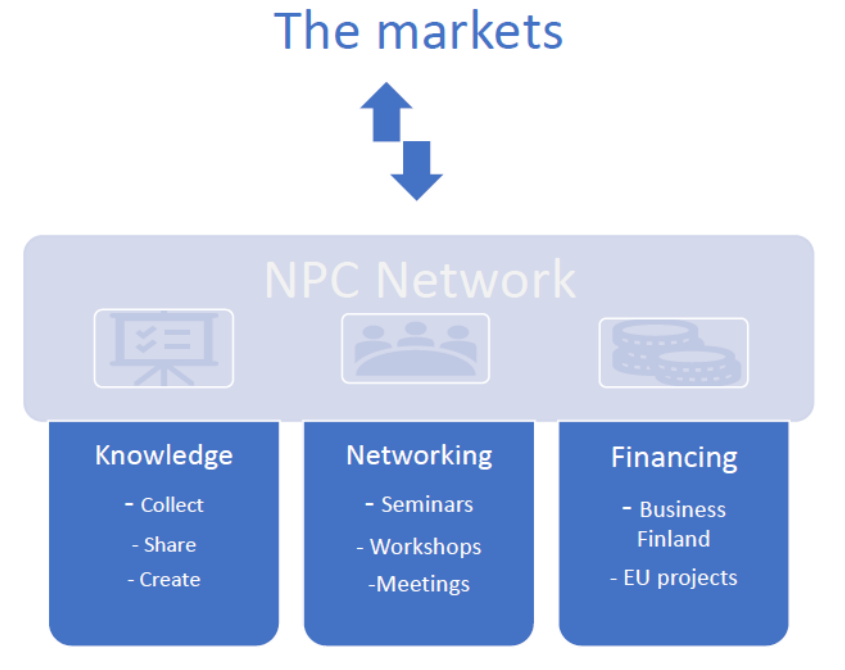
	Low-tech industries	High-tech industries	KIBS (knowledge-intensive business service)
Competition criterion	Price / quality	Innovation	Customer orientation, innovation
R&D intensity	Low	High	High or low
Patenting	Low	High	Low / copyright
Type of innovation	Process innovation	Product innovation	New concepts and ICT-based services
Scale of innovation	Incremental	Fundamental	Incremental and fundamental
Type of knowledge	Tacit / practical	Codified / theoretical	Codified and tacit
Type of learning	Learning by using	Searching and exploring	Interactive learning
Cooperation	Customer-producer relationships	University-producer relationships	KIBS-client relationships
Skills and competencies	Practical knowledge	Theoretical knowledge and cognitive skills	Theoretical and practical knowledge

Schienstock & Hämäläinen

A Plastics Roadmap for Finland

A need for New Plastics Finland knowledge network and the coordination party, aiming for:

- to enhance the material competence of companies
- strengthen the value chains of plastic recycling and research
- disseminate knowledge on solutions to replace traditional fossil-based plastics
- develop standardisation and unite the network with key international forums in the field.
- https://muovitiekartta.fi/in-brief/
- NPC was established in 2019 as part of Muovipoli Oy, to support rise of **market-based biomaterial innovations** in cooperation with companies, research organisations and the network



Boosting up by Business Finland

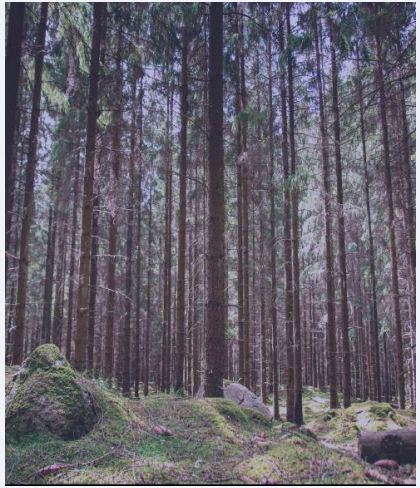
- BF is the Finnish government organization for innovation funding and trade, travel and investment promotion under Ministry of Economic Affairs and Employment
- BF financing: Max 50 % for SMEs, 40 % for big companies. To get max. rate, big companies has to use 40 % of the budget in subcontactions from SMEs and universities

→ **BF financing covers 100 % of subcontracted services**

- In the example project BF financing:
  - covers fully 550 k€ subcontraction services from SMEs and universities. As internal project the oursourced costs 180 k€ are fully covered by the company
  - enables realisation of the project 65 % larger
  - integrates the research and practice-based knowledge in market-based, industry-owned innovation processes
  - supports growth of ecosystems and open innovation activities

	Internal RD project, €	BF project, €
Salaries	300 000	300 000
Salary related costs	120 000	150 000
Overheads	85 000	225 000
Travelling	20 000	20 000
Material and accessories	80 000	80 000
Equipment	50 000	50 000
Subcontracted services		
SMEs	100 000	300 000
Research parties	80 000	250 000
Concern / intress companies		
Other		
TOTAL	**835 000**	**1 375 000**

Actions so far



- Support in projecting and financing applications of R&D projects in the field of bio- and recycled plastics (Business Finland, ministries and EU funding)
- Help in finding resources and colloborative partners
- Research and testing resources for project realisation
- Networking events
  - Opening seminar 5.3.2019
  - Biocomposites seminar 26.9.2019
  - NPC Research seminar 10.12.2019
  - Bioplastics in packaging 11.3.2020
  - Plastics in carbon-neutral and biocircular economy 16.12.2020
- Gathered and disseminated information of bioplastics, novel materials, their properties and processing, utilisation possibilities in end-use applications, research knowledge and infra
  - Publishing of Bioplastics-guide together with FIPIF (in Finnish) 25.11.2020 www.muovipoli.fi, www.plastics.fi

Thank You!