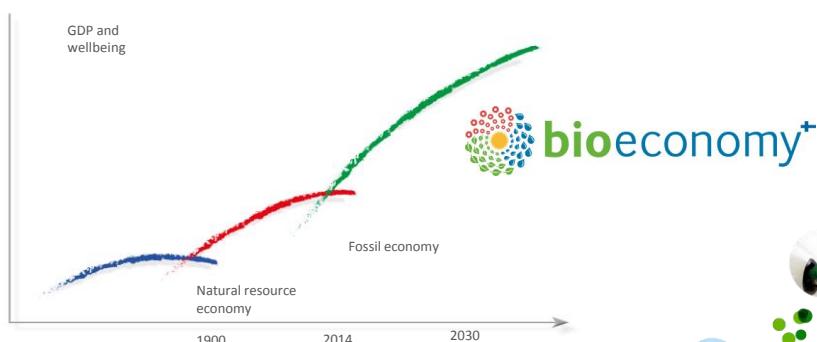




Bioeconomy: The next economic wave

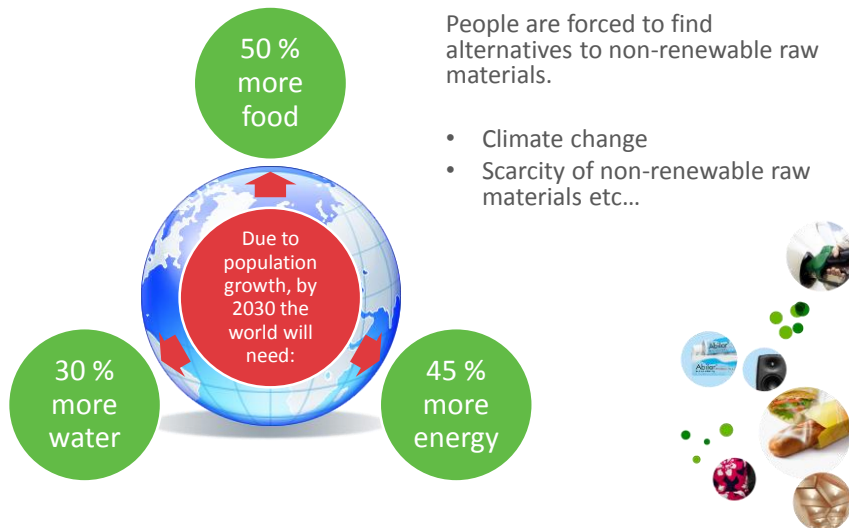


The next wave of economy is bioeconomy, which produces economic growth and wellbeing.

Finland is a bioeconomy forerunner. We have plenty of natural resources, expertise and agility.



Bioeconomy: Born from necessity



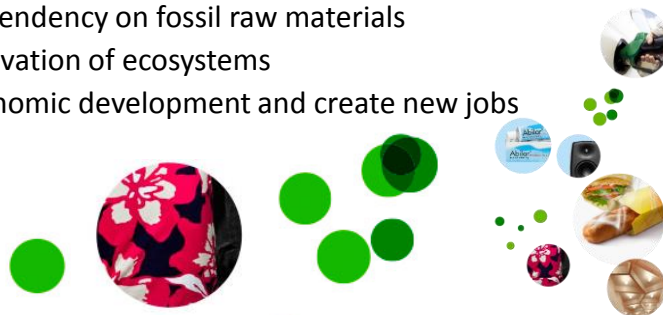
Bioeconomy is the solution

Bioeconomy:

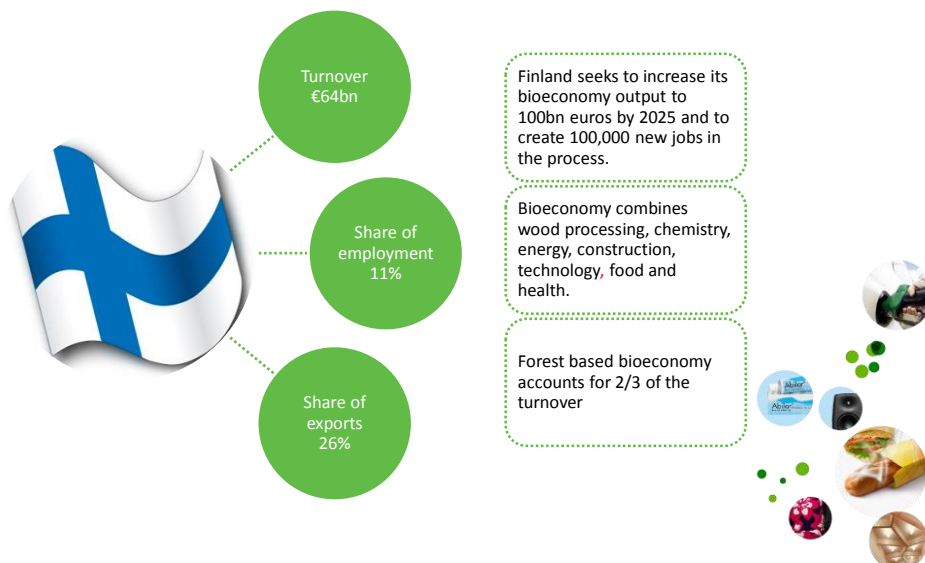
- Sustainably uses biological natural resources to produce goods, energy, food and services

Aims:

- decrease dependency on fossil raw materials
- prevent deprivation of ecosystems
- promote economic development and create new jobs

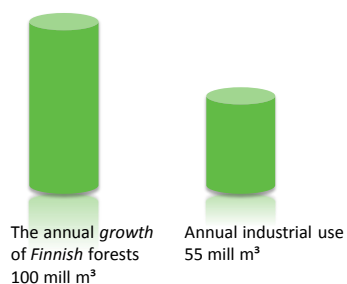


Bioeconomy's significance for Finland



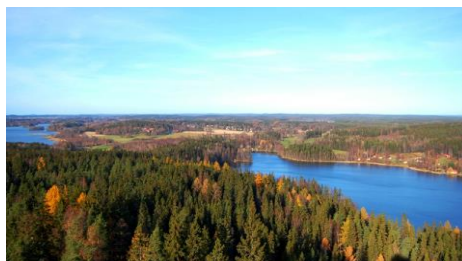
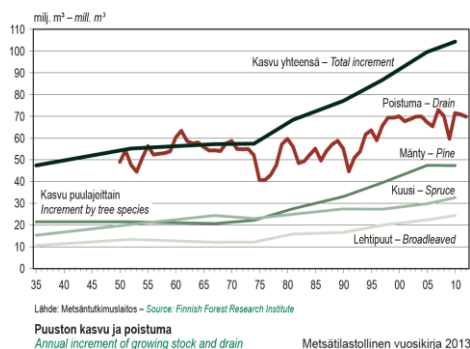
Forest bioeconomy

- Of our total land area, 80% is covered by forest, which is managed so that it produces significantly more wood than we currently use.
- The forest-based industry is a Finnish pioneer in bioeconomy. It utilizes renewable natural resources while incorporating economic, social and ecological sustainability in its activities.



The potential of Finnish forests

Finland's well-being is based on our ability to use renewable resources efficiently and sustainably. Forests and clean nature have always been the basis of our existence.



2.9.2014

Finland's bioeconomy strategy



Prime Minister's Office:
"Bioeconomy in Finland
– evaluation of the need of a national
strategy
Final report of the Bioeconomy Working
Group
30.9.2010"

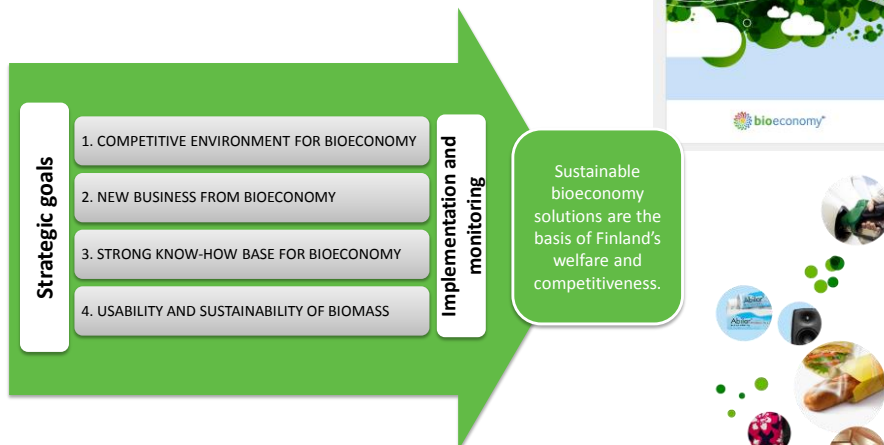
"Bioeconomy is sustainable management and use of renewable resources, production of products and services from them, as well as use of biological and technical methods in the production"

"The country that first is able to conclude the right path leading to bioeconomy, will gain a longstanding competitive edge"



Finland's bioeconomy strategy

(adopted by Government on May 8, 2014)



Implemented actions Q2/2014 – Q2/2015

Focus areas; Investments, regulation and export

1. Boosting investments – An International Biorefinery Competition
2. Finnish bioeconomy priorities for the EU defined
3. A regulatory survey on "Bioeconomy bottle necks and boosters"
4. Biomass Atlas combining public data on biomass resources
5. Promotion of exports of biobased products and technologies

Supportive actions

6. A communication and media action plan
7. Tools for promotion and a public discussion



International Biorefinery Competition

- First of its kind in the world
- Entries represented investments of 1.5 B€
- Winners
 - Spinnova – fibre yarn
 - Biovacka Suomi – transportation fuels and nutrients
 - Kemijärvi consortium – new pulp products and chemicals



29.1.2015

Outcomes from the Strategy

- A strong national will to develop the bioeconomy
- Effective co-operation model between ministries and stakeholders
- A positive outlook for the future which can be seen in increase of investments
- Increased interest from non-forest industries to utilise biomass
- Public investments into the bioeconomy and infrastructure
- Increased public acceptance for use of biomass



Recent large investments



Metsä Fibre Äänekoski Mill (Source: Metsä Group)

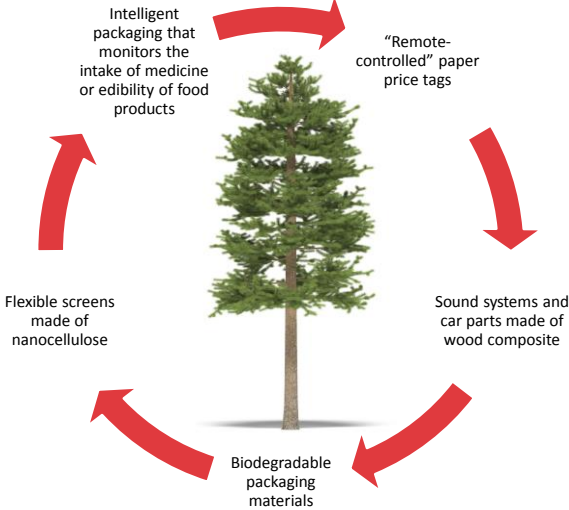


Lappeenranta biorefinery (Source: UPM)

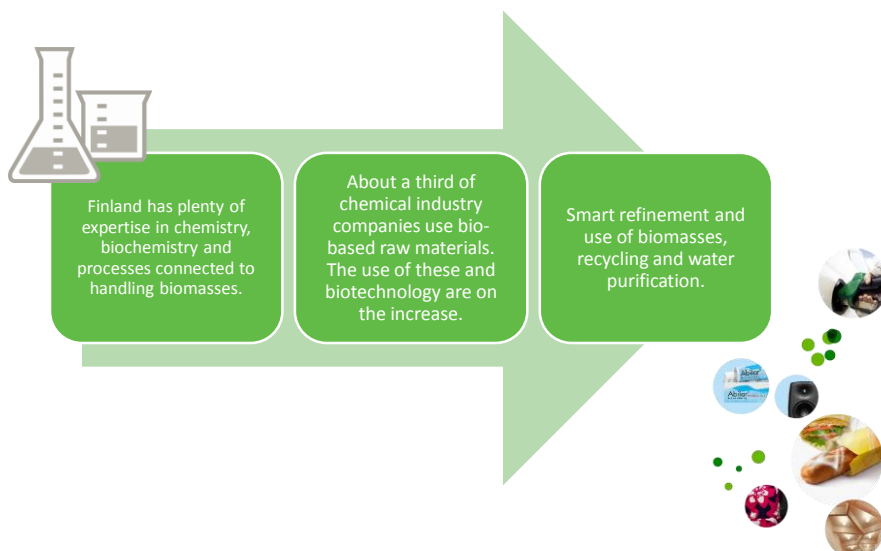


Wood will serve many functions in the future

Examples of products :

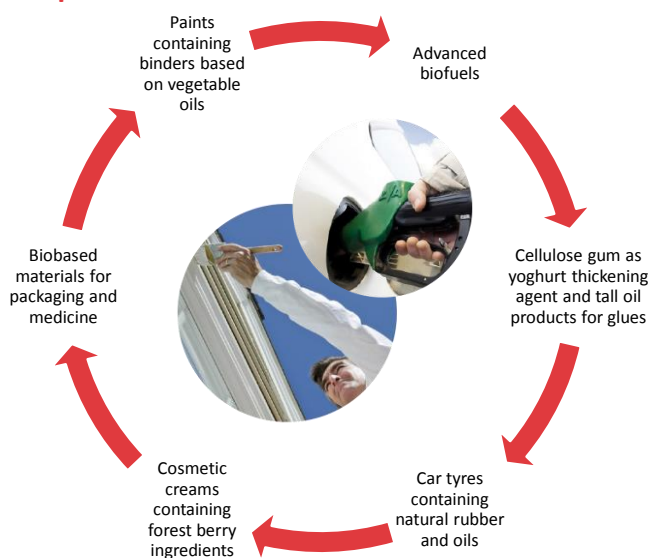


Chemistry enables bioeconomy



Biobased chemistry

Examples close to consumers:



The Government's vision for 2025: Secure, renewing, sustainable Finland as part of Europe



17

Bioeconomy and clean solutions - objectives of the new government



- Bioeconomy and clean solutions is one of the five strategic priorities of the new government
- Themes:
 - Cost-efficient carbon-free, clean and renewable energy
 - Wood on the move and new products from forests
 - Circular economy and improvement on water quality
 - Profitable food production
 - Nature policy
- Funding 300 M€ for the government term (2016 – 2018)



Selected actions from the government action plan

- Energy and climate strategy for 2030 and support measures to increase share of renewables in energy production and in traffic
- Increasing supply of wood and promoting investments in the forest sector
- Accelerating new innovations in bioeconomy and circular economy by piloting and demonstration using national and European financing, like BBI and EFSI
- Team Finland growth programmes to boost exports and international investments to Finland



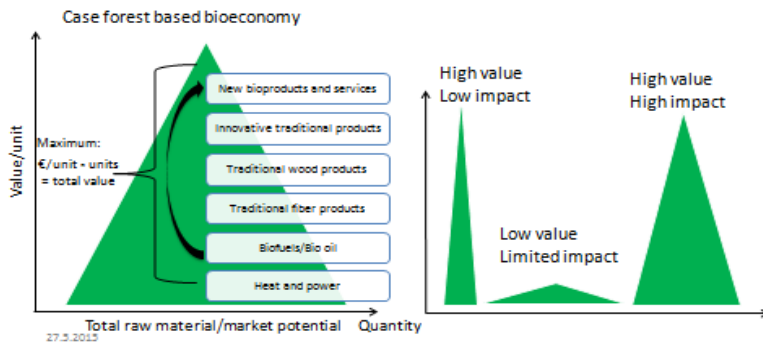
Finnish bioeconomy priorities for the EU

1. **Enhance competitiveness and growth** – A shared vision, favourable and predictable environment
2. **Create demand for biobased products** – Consumer awareness, user-oriented experiments
3. **Finance R & D & I** – Financing of first of its kind investments, pilots and demonstrations.
4. **Ensure acceptability, availability and sustainability** – Ensure public acceptability of versatile and sustainable use of biomass



Cascade use - Value added and impact from bioeconomy

- A multiple use by a market driven approach provides most added value and the greatest impact

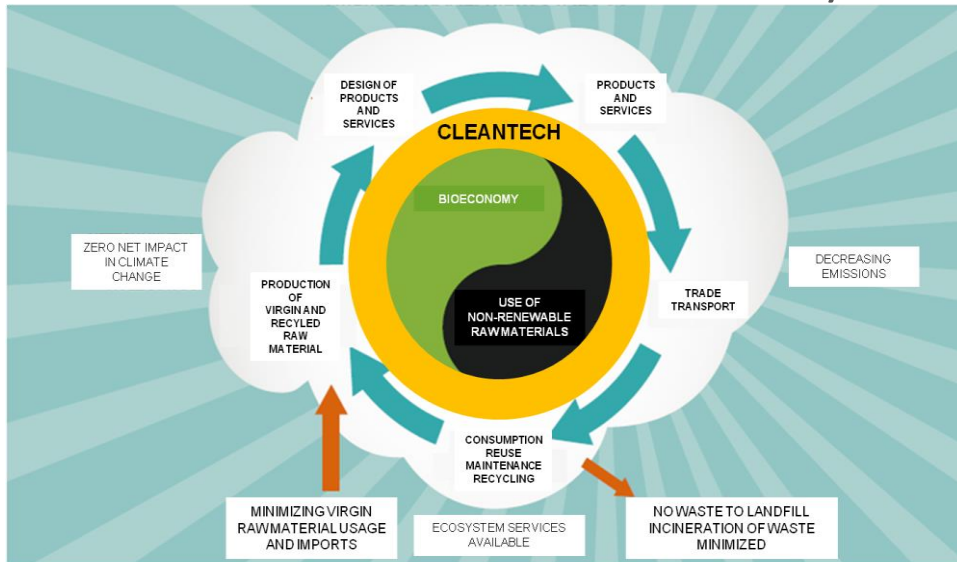


Cascading use of wood

- Cascading use refers to using biomass at least once before being discarded or used for energy
- Based on waste hierarchy where material use is preferred over energy use or landfilling
- Has been introduced in several publications and EC communications with varying definitions
 - E.g. differences in how energy use of residues is interpreted
- Cascading use of wood should be considered from the perspective of the whole wood utilisation cycle
 - the role of the wood producing regions differs from the consumer regions with more fibre recycling. As the producing countries export a significant part of their wood biomass as pulp, paper and board, timber and plywood, a major part of the cascading cycles take place outside their borders
 - Hence a regional approach is needed for the best overall outcome



Carbon Neutral Circular Economy

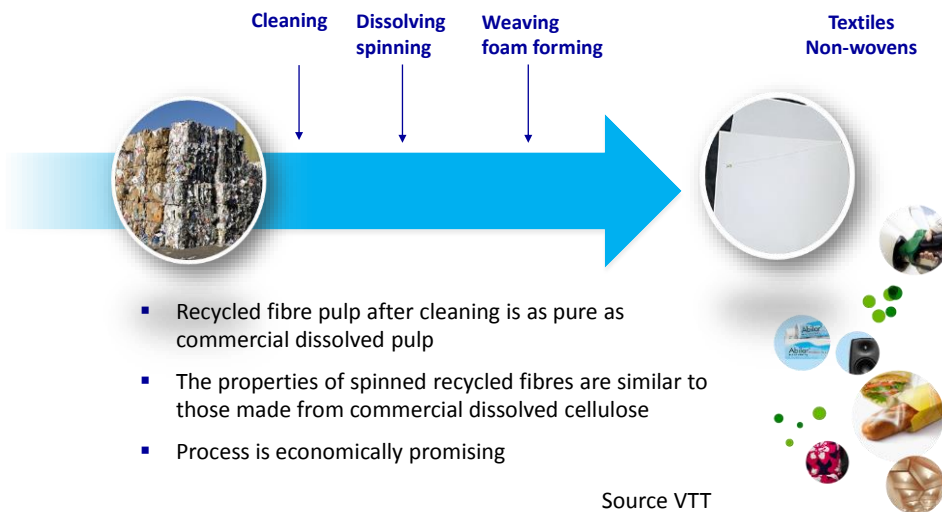


Source: SYKE



Recycling example

Renewable textiles from recycled paper and cardboard



Source VTT

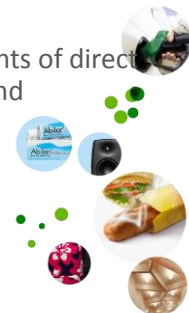
Future success depends on many factors

- ☐ Raw material availability and price
- ☐ Industrial infrastructure
- ☐ Competence base
- ☐ Willingness / ability to partner and seek new business
- ☐ Product markets
- ☐ Availability of private and public funding
- ☐ Political will



Funding from H2020 / SC2 and BBI JU

- Finland has received 15 million euros of H2020 funding from SC2 and BBI calls.
- Based on participation, success rate has been 17,3%. Based on funding received, success rate has been 8,5%.
- Funding recipients by type of organisation:
- SMEs: 3 kpl (1104 keur)
- Large enterprises: 11 kpl (5489 keur). Attention! Recipients of direct funding 3, the rest will participate BBI projects with in-kind contribution.
- Research institute: 18 kpl (6659 keur)
- Universities: 6 kpl (1304 keur)
- "Other": 5 (554 keur)



Funding from H2020 / SC2 and BBI JU

- Funding has been received from the calls below (received funding):

- BBI.VC1.D2: 1 kpl (4641 keur)
- BBI.VC1.R1: 1 kpl (551 keur)
- BBI.VC2.R2: 4 kpl (350 keur)
- BBI.VC2.R4: 6 kpl (374 keur)
- BBI.VC3.R7: 3 kpl (995 keur)
- BG-07-2015: 3 kpl (1795 keur)
- BG-10-2014: 1 kpl (297 keur)
- BG-15-2014: 1 kpl (103 keur)
- ISIB-01-2014: 1 kpl (308 keur)
- ISIB-02-2014: 1 kpl (98 keur)
- ISIB-02-2015: 2 kpl (270 keur)
- ISIB-03-2015: 2 kpl (616 keur)
- ISIB-04a-2014: 1 kpl (754 keur)
- ISIB-11-2014: 1 kpl (81 keur)
- ISIB-12a-2014: 1 kpl (119 keur)
- ISIB-12c-2015: 1 kpl (192 keur)
- ISIB-12e-2015: 1 kpl (58 keur)
- SFS-01c-2015: 1 kpl (546 keur)
- SFS-06-2014: 1 kpl (84 keur)
- SFS-07a-2014: 1 kpl (150 keur)
- SFS-07b-2015: 2 kpl (550 keur)
- SFS-08-2015: 1 kpl (1035 keur)
- SFS-08-2015-1: 1 kpl (50 keur)
- SFS-09-2014: 1 kpl (81 keur)
- SFS-13-2015: 1 kpl (431 keur)
- SFS-16-2015: 1 kpl (551 keur)
- SFS-19-2014: 1 kpl (80 keur)



Conclusions

- Global drivers will force the transformation to a sustainable bioeconomy, based on use of renewable raw materials; the change is happening already
- The bioeconomy will not be a new industrial sector; it will rather bring together the forest, chemical, energy and building etc... sectors.
- Opportunities require renewal: new products and solutions meeting new needs, created through new cross-industrial partnerships
- The EU and member states have a common vision on bio and circular economies and there are a lot of plans and activities to speed up the change
- Consumer behavior will define the market. Any product and industry has to compete for consumers' interest and acceptance. Act sustainably, measure and communicate it.

