



Underpinning the
vital role of the forest-
based sector in the
Circular Bio-Economy

InnovaWood Virtual General Assembly 8 July 2020

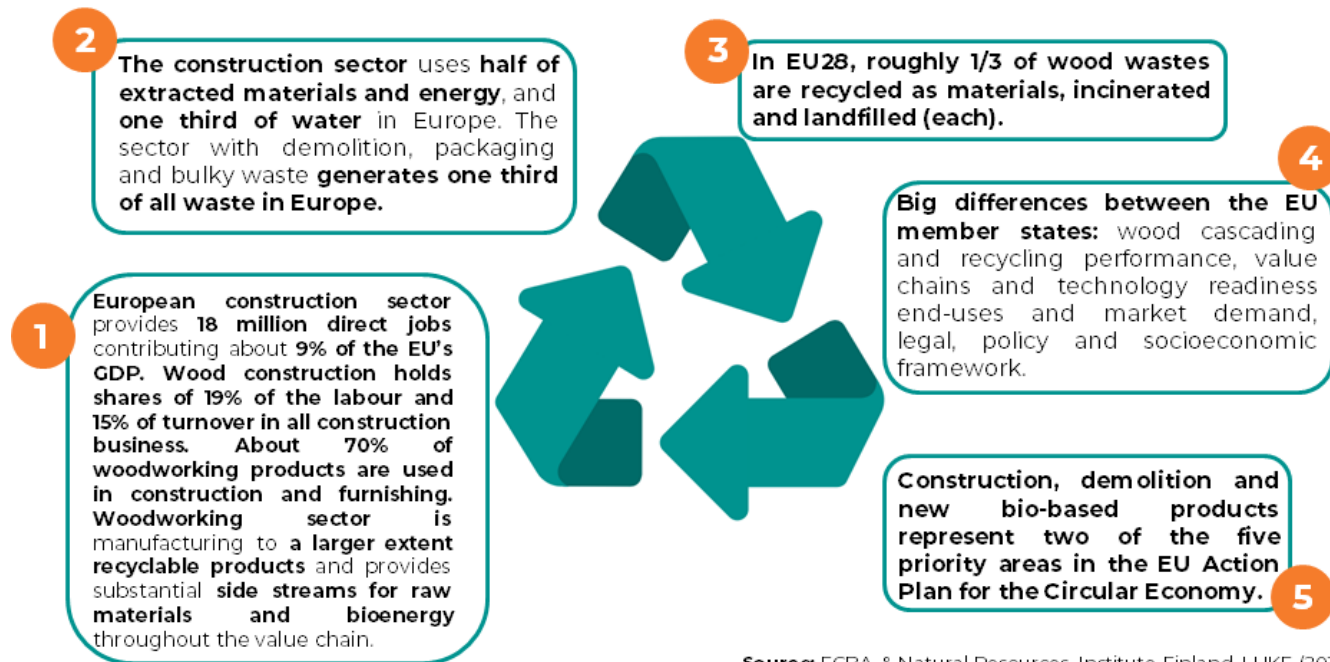
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Overall role of value chains of wood-based products and side streams in construction sector in Europe





WoodCircus Consortium

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FCBA

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Forest-based Sector
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EPF

European Wood-Based
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VEOLIA

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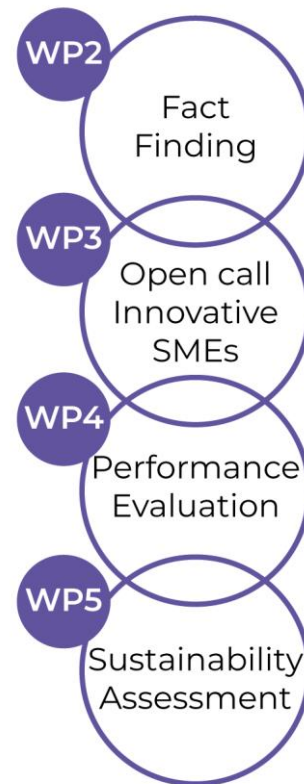
SAIB

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How do we identify best practices?

- **Collection and assessment of case studies**
 - Interviews, Fact Finding & State of the Art WP2
 - Open Call for SMEs WP3
 - Process Performance evaluation WP4
 - Sustainability & Impact Assessment WP5
- **Criteria development**
 - Internal workshops
 - Feedback from expert interviews
 - Trial criteria with available cases





SWOT analysis across EU regions - WP2

SOUTHERN	CENTRAL	NORTHERN	EASTERN	SOUTHERN	CENTRAL	NORTHERN	EASTERN
<ul style="list-style-type: none"> High recycling & resource & wood waste efficiency (almost 100%) Well-functioning value chain (active companies and stakeholders) High-level long experience in machine manufacturing Large total volumes of side-streams, renewable raw material High quality products Inherent in forest and bioenergy sectors Increasing interest in research Positive perception of policies in environmental terms 	<ul style="list-style-type: none"> Large volumes of lignocellulosic materials and side stream (certified) High resource efficiency and markets (e.g., wood chips, pallets) Sorting broadly implemented for by-products from wood, less for packaging waste Circular approach: self-sufficiency in heating the industry plants High quality products from fresh side streams Good perception of policies Analytical quality control (waste) by third party Recycling of (washing) water Eco-organisation for the extended responsibility schemes Sophisticated products Leading technology in innovative machine engineering and plant design (Germany, Austria) "Fair-priced" recycled materials for wood panel and energy industries Almost no landfilling 	<ul style="list-style-type: none"> Circular economy and sustainability approach in the Nordic society and among decision makers Large total volumes of side-streams, renewable raw material and bioenergy sources (certified) High quality, uniform by-products for industrial and bioenergy uses (comp. other side streams, forest chips) Shared procurement and delivery with other wood assortments, efficient comminution and bioenergy technology High resource efficiency and almost closed loops (+) Well-functioning value chain and market for chips (+) Efficient integrated forest products companies Versatile markets in energy sector Regional solutions and public support in RDI, investments and regulatory work (Triple Helix) Knowledge and expertise, future-oriented product development (esp. forest industry corporations, industry parks, municipal and private energy companies) Many companies of different size in the business 	<ul style="list-style-type: none"> Implementation of efficient procedures in the production process (i.e. slim production) Implementation of material efficiency procedures Use of new processing technologies Central role of forest sector Diversity of forest resource types and manufacturing strengths Lower labour costs Foreign Direct Investment in forest value chain Good incentives by public bodies Smart specialisation alignment on topics related to circularity 	<ul style="list-style-type: none"> Logistics costs and delivery delays Small and scattered amounts Reliability on the legislative systems Lack of specific technical know-how on fuel gas filtration plants, High energy consumption in production processes and high maintenance costs High delivery costs for wood cleaning Implementation of efficiency practices still limited High presence of SMEs 	<ul style="list-style-type: none"> Markets mainly restricted to natural wood and clean residues Limited recycling options except for particle boards Small volumes of wastes (some countries) Saturated competition on side streams Unpredictable costs and low profitability Dust emission issues -> filtering costs of combustion Missing regionally adapted public policies Clear and quantified objectives among companies need external expertise Low innovation potential and R&D investments Value chains not well organised Export less developed (some countries) Controls carried from with a national point of view Low customer perceptions of product quality from recycled materials High costs of waste treatment Long transportation distance Limited storage space 	<ul style="list-style-type: none"> Varying profitability and lack of capital, investments and RDI in wood product and bioenergy industries, except corporations and large energy companies Lack of knowledge of valorisation and pricing of alternative products (SMEs, further processing) Unstable markets and low prices for side streams, except chips (for suppliers), saw dust depreciation in material uses Only two wood panel industries provide no demand for side streams Competition and costs of side streams are critical in some regions (for users) Unprofitability of wood-based electricity generation, esp. CHP plants Logistics costs and scattered sources of raw materials, semi-finished products and side streams Landfill materials (most of ashes, painted, treated and glued wood) and contaminated wastes Weak durability of some side stream based products Different interests and resource potential for incentives of integrated forest products companies and SMEs Upscaling from research to commercialization proceeds slowly 	<ul style="list-style-type: none"> Lack of technological development in recycling waste wood and valorisation of side streams Lack of awareness of companies (especially SMEs) and stakeholders about circular bio economy Lack of strategies for forest and wood-based industries High price of wooden products High costs to comply with regulations Few industry actors willing to invest – waiting for government support Forest value chain split internationally; primary processing mostly done outside the country limiting recoverable side streams Export of wood waste for energy production limits local value Industrial interest in meeting consumer demand not centred on environmental/circular goals Historically risk adverse sector

Strengths

Weaknesses

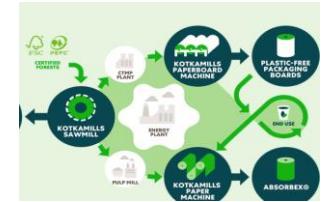
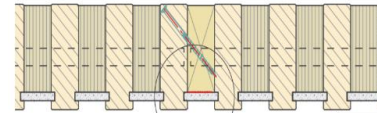
SOUTHERN	CENTRAL	NORTHERN	EASTERN	SOUTHERN	CENTRAL	NORTHERN	EASTERN
<ul style="list-style-type: none"> Eco-attitude and circular economy in society Green deal agreements between private and public parties Large number of unemployed residue types High-value added products Improve waste management for energy production Environmental certification, professional qualification Investments in biomass boilers (internal use) Reducing costs of recycling through the improvement of processes 100% circular economy involving post-consumer wood 	<ul style="list-style-type: none"> Growing demand of side-streams Improving sorting and requalification Full pipeline to clean production processes Reducing wastes and hazardous agents (LCA) Upgrading cogeneration Reducing transportation distances and creating circuits of producers and users Growing pre-fabrication industry (houses and products) Improving recyclability by natural components Sustainable managed forests: high-end social and environmental products Implementing low carbon strategy Raising awareness of consumers on products from recycled wood Developing European harmonisation for uniform application of legislation and regulation Implementing product-specific standards (CE marking, EPDs) 	<ul style="list-style-type: none"> Positive perspective for circular economy Carbon sink approach and green policy incentives Getting business value from carbon storage, climate change mitigation and voluntary emission trading Positive and predictable regulation development Green deal agreements between private and public parties to achieve sustainable development goals (+) Globally limited biomass resources call for cascading New side-stream based products and users: value-added bioeconomy products, chemical and composite products (BtB and BtC), bioplastics, replacing coal and oil in energy generation with biogas, pellets and other wood-based products, renewable liquid fuels, biochar (> 60 known uses), uses for off-cut pieces of secondary products, building elements and furniture billets, wood panels, construction insulation products (+) Trustful company relationships and collaboration (+) Optimised integration: industry park approach, industrial ecosystems of large companies and SMEs Better classification, sorting and knowledge of side streams and end-of-waste criteria (suppliers, users) Longer life-cycle and better durability, LCAs and EPDs for side-stream based products Markets and technology are developing in cascading Market and customer surveys, economic assessment of alternative products, proofs-of-concept Increasing and disseminating knowledge of alternative side stream products, esp. for secondary wood processing Adoption of new practices from other industrial sectors, and Europe and Eastern Asia 	<ul style="list-style-type: none"> Raise awareness to consumers Active participation of EU in supporting the transition to circular economy Knowledge transfer to value chains Visibility of forest sector Supporting networking and partnering Improvement of the classification and standardization system Quality and environment certification Promotion of wood use by public sector Implementation of tools like labelling Encourage incentives for the transition to circular economy (refund systems, ecotax systems) Forest increment greater than harvest – resource availability is increasing 	<ul style="list-style-type: none"> Forest / wood diseases affecting the raw material quality Resource supply bottlenecks High demanding legislation and complex administration Image of recycled materials and products Price dumping by new market players Slow and expensive development of new Late catching up of public bodies about circular economy 	<ul style="list-style-type: none"> Unstable markets and Unpredictable (low) prices for side streams Specific requirements of different markets for products of recycling Lack of demand Lack of professionals and entrepreneurship Missing risk investments Environmental risks Strict regulations with multiplicity High waste disposal taxes Lack of valorisation strategy at national level Low knowledge and few good practices to recover materials Lack of cohesion and agreement between the actors in forestry Negative image of wood harvesting 	<ul style="list-style-type: none"> Slow reactions to changing product and customer markets in company strategies and public policies Slow and expensive development of new products and uses for side-streams Continuing low profitability and investment capacity of wood product and wood-based electricity industries Continuing scarce RDI resources and lack of proofs-of-concept, especially among SMEs of wood product and bioeconomy industries Unpredictable regulation and subsidizing policies of bioenergy and waste management (EU, Finland) Decreasing district heating outside urban districts Large production units and increasing transportations add to the environmental loading Lack of trust and collaboration between companies to build industrial ecosystems Disagreement of different producers and interest groups about the priority uses of side-streams and regulation and subsidizing policies (saw mills – bioenergy – wood panel industries) Omitting societal requirements, renewable raw material brand and carbon sink approach in strategic planning and dissemination to the different stakeholders and big audience Eventual lack of professional workers and entrepreneurs in the supply and manufacturing stages of the value chains (in some regions) 	<ul style="list-style-type: none"> Lack of data and information Lack of harmonized regulations Regulation not actually practiced and followed Lack of coordination policies within regional, national and European markets Perception of the consumers about potentiality of the products Lack of demand on circular products Overall perception of policy as complex Lack of awareness on circular economy strategies Lack of awareness on environmental impact and sustainability Lack of transparency or government instability

Opportunities

Threats

Good practices collection – WP2 & 3

- Study of a wide range of company cases in reuse, recycling and circular economy approaches





Performance evaluation – WP4

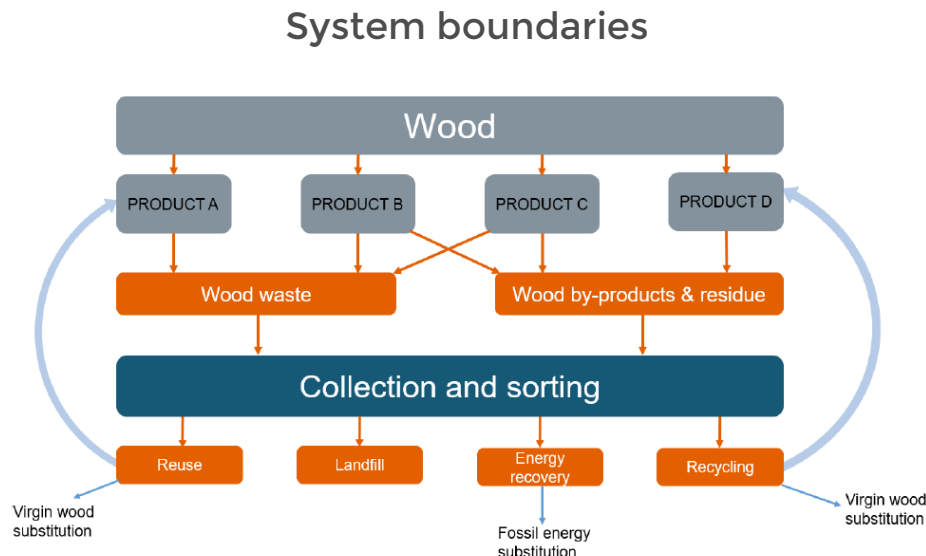
- Develop a set of applicable criteria and indicators for assessment of good practices
- Testing and validation with experts

Criteria	Rating system	Criteria	Rating system
#1 Share of cascaded / recycled / co-used biomass	Percentage %	#7 Sustainability of biomass	+1: For third party labels
#2 Level of recycling	+2: Up-cycling, closed-loop +1: Down-cycling 0: Incineration -1: No recycling/landfill	#8 Innovation	+1: when adding innovation and R&D 0: Build on existing available technology -1: Use existing available technology
#3 Waste management	+1: for self-initiated collaboration 0: waste management system -1: Incineration / no recycling	#9 Social acceptance	+1: For largely positive perception 0: For no broader perception -1: For rather negative perception
#4 Lifetime	Average lifetime of the product group	#10 Political and regulatory framework	+1: Legal basis given 0: Small adjustments to existing law required -1: Significant changes in existing law required
#5 Toxicity	+1: Class A/B, recovered class C/D 0: Class C -1: Class D	#11 Resource efficiency	Biomass Utilisation Factor
#6 Energy efficiency	+1: Non-renewable energy cost significantly lower than reference value 0: Non-renewable Energy cost similar to reference -1: Non-renewable Energy cost significantly exceeding reference value		



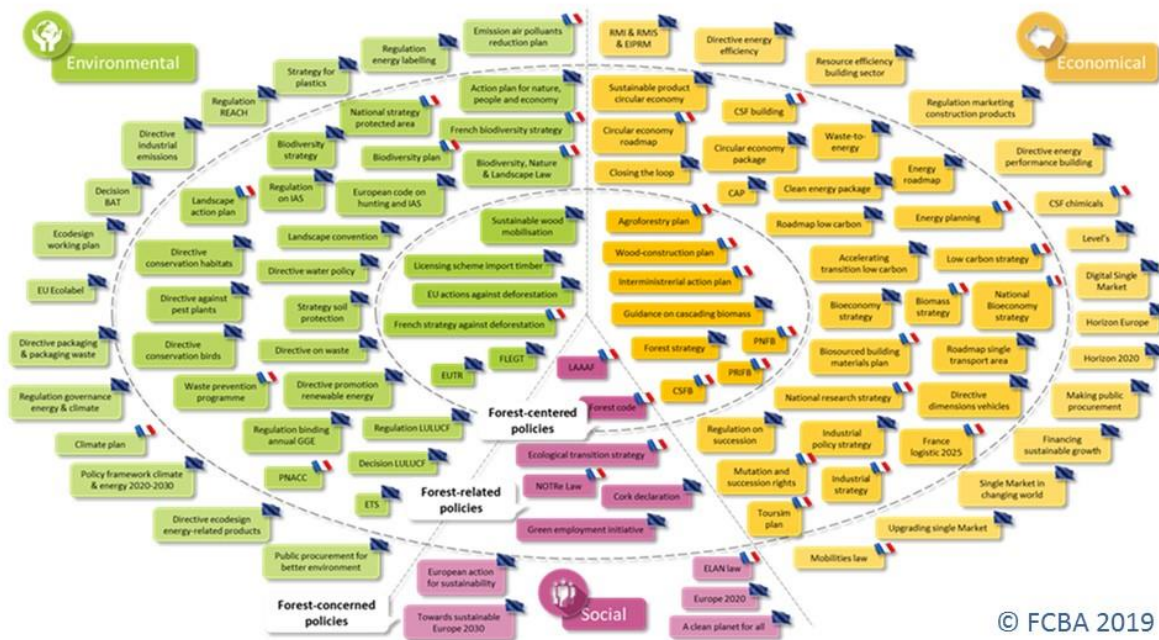
Life Cycle Assessment – WP5

- Assess environmental sustainability of selected good practices of wood processing and waste recycling scenarios
- Reflect relevant EU strategies
- According to standards ISO 14040-44 (LCA) and EN 15804



Policy analysis & RDTI strategies – WP6

- Mapping of relevant policy documents
- Distil relevant key messages & recommendations
- WoodCircus Policy briefs & White paper
- Wood Sector in the **Green Deal**





Tangible results for decision-makers

Good practices: numerous and diversified projects, processes, actions, initiatives grouped by reference area of application:

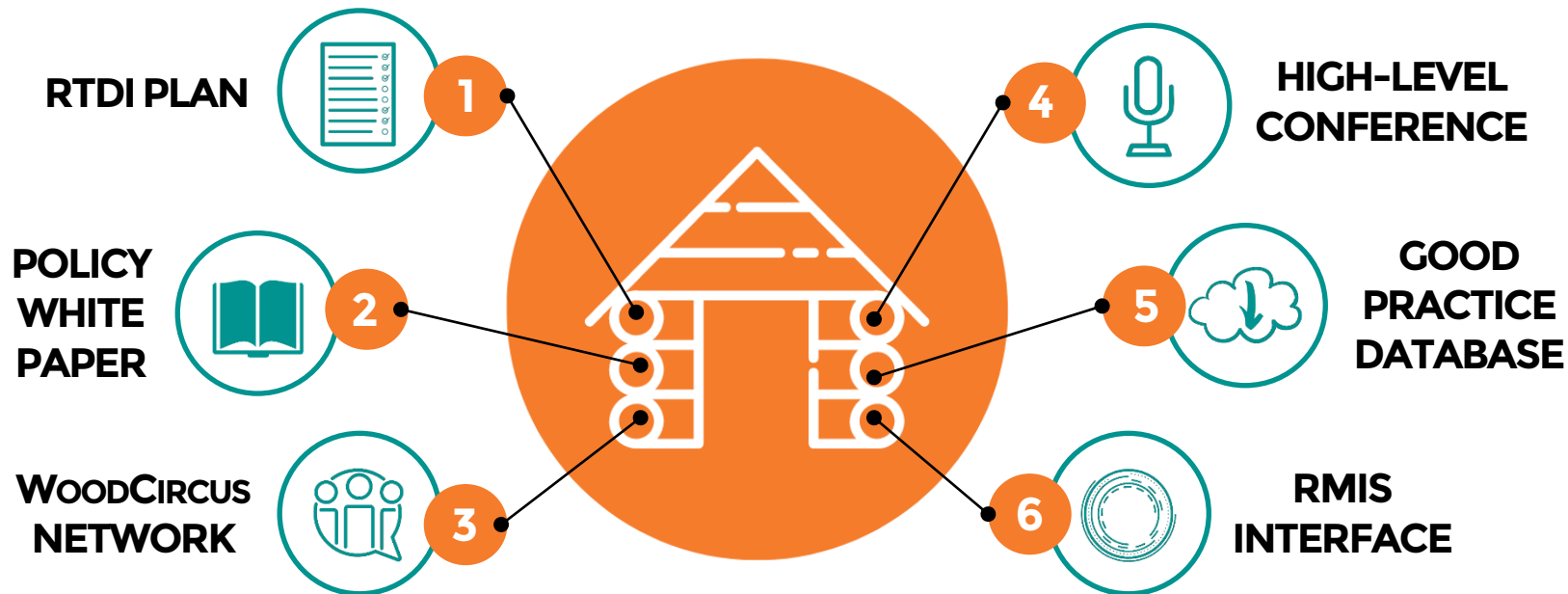
- ✓ Products and materials
- ✓ Processes and technology
- ✓ Management and efficiency
- ✓ Innovation
- ✓ Construction and demolition

Recommendations:

- ✓ Circular economy approaches
- ✓ Sustainable management of side streams
- ✓ Resource and energy efficiency
- ✓ Innovation
- ✓ Well functioning value chains
- ✓ Stakeholders platforms
- ✓ Policies, regulations and public funding
- ✓ Eco-friendly industrial processes
- ✓ New business models
- ✓ Low carbon strategies



Main deliverables



Acknowledgements



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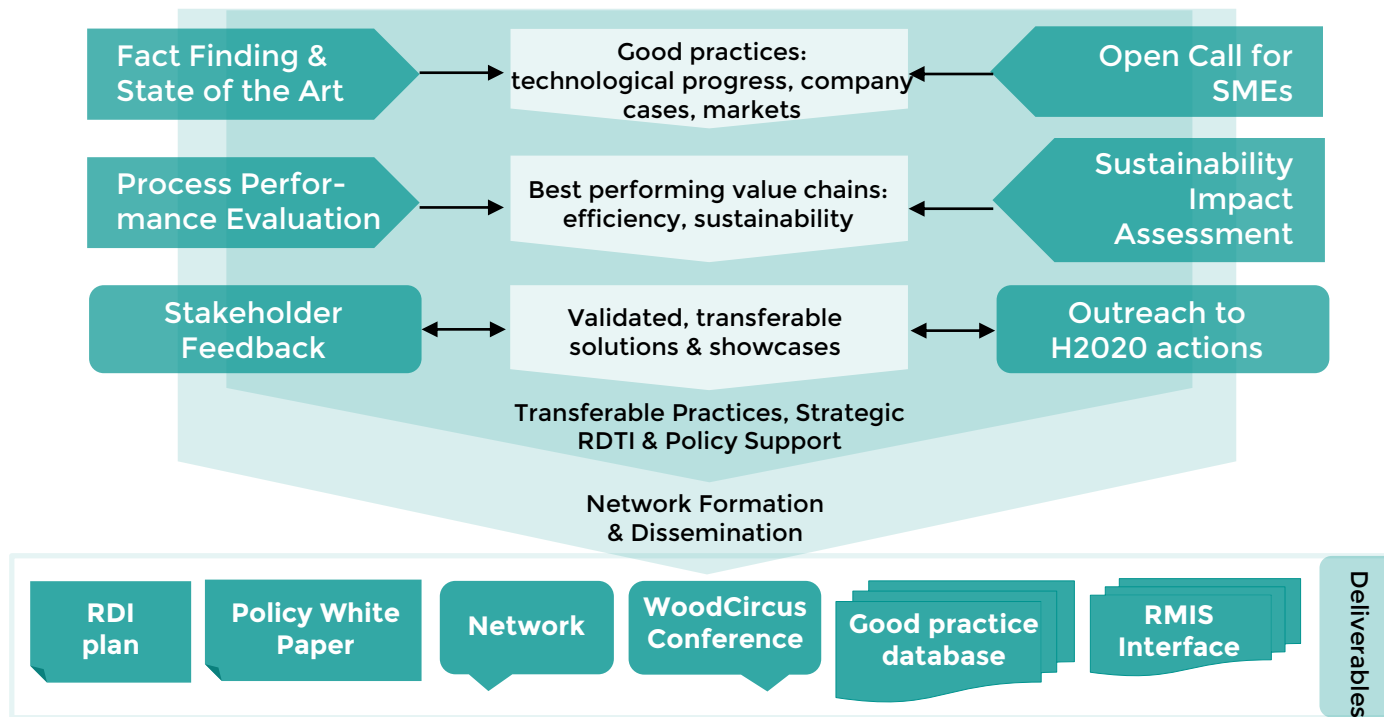
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WoodCircus Flowchart





Policy analysis & RDTI strategies – WP5

- Mapping of relevant policy documents
- Distil relevant key messages & recommendations
- WoodCircus Policy briefs & White paper

