DIABOLO
POLICY
BRIEF

Responding to European, national and regional challenges with harmonised forest information

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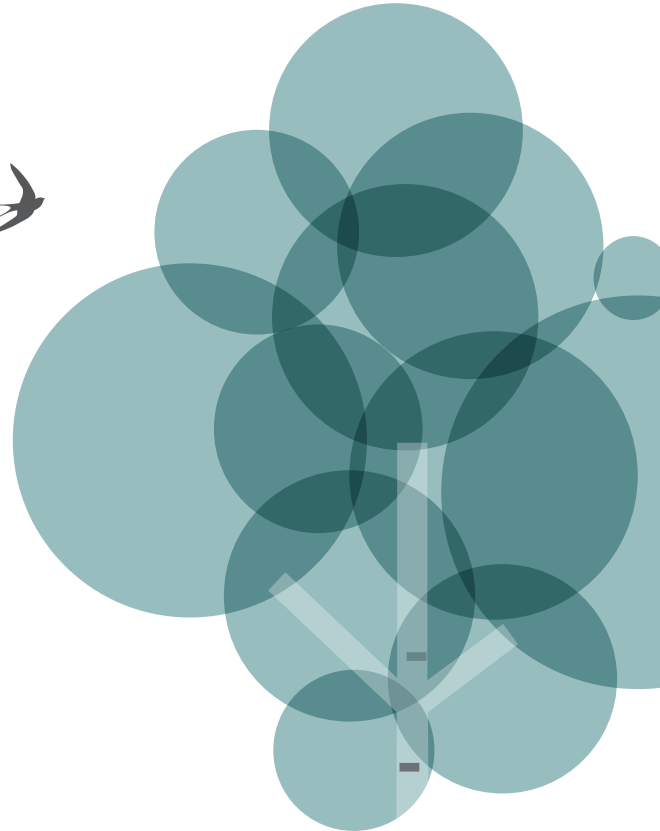
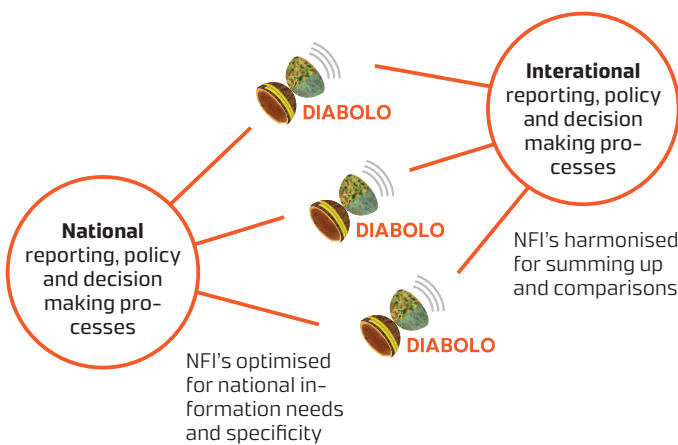**Distributed, integrated and harmonised national forest information and open outlook data support policy making. Consequently, transparency of forest related policy processes increases at the European, national and regional level.**

TOWARDS SUSTAINABLE, RESILIENT AND CLIMATE-SMART BIOECONOMY

Developing sustainable and circular bioeconomy that serves our society, environment and economy requires statistically sound and harmonised data and outlooks on forest resources and their use. More specifically, bioeconomy investments across Europe rely on the availability of resources. At the same time, ensuring holistic sustainability must not be compromised. Consequently, there is a need to address the UN Sustainability Development Goals (SDGs) while reconciling bioeconomy investments and operations.

DIABOLO - A BALANCE BETWEEN SPATIAL AND TEMPORAL HARMONISATION

National Forest Inventories (NFIs) are optimised for national information needs and specificity. For international reporting, policy and decision making processes there is a need to further harmonise forest information for summing up over countries and comparisons between countries. However, this spatial harmonisation needs to be balanced with temporal harmonisation, i.e. with the existing invaluable time series often available only at the national level. DIABOLO aimed at bridging the gaps in the provision of forest information at European, regional, national and sub-national level.

DIABOLO IS BASED ON THE EUROPEAN NETWORK OF NATIONAL FOREST INVENTORIES (ENFIN)

NFIs represent comprehensive, reliable and large-scale monitoring systems that are based on sound statistical designs - essential to fulfill the quality criteria of international forest monitoring and reporting processes.

Legend:
- Artificial
- Agricultural
- Forest
- Nature
- Inland Water
- No Data

Map of land cover 2012. Source: Copernicus CORINE Land Cover 2012 for NUTS-regions ES61, ES63, ES64, EEA CORINE Land Cover 2006.

↑ *Land-use varies to a great extent between the European countries and regions due to the country-and region-specific socio-economic, ecologic and cultural settings.*

↑ *Since 2003, ENFIN has served as a European network to promote NFIs, harmonise forest information and support decision makers in a broad range of forest related policies. Source: enfin.info*

WP1 DIABOLO

POLICY ANALYSIS OF DEMANDS FOR AND PROVISION OF FOREST DATA AND INFORMATION

WP1 built a process for transferring expert knowledge about future challenges to politicians, ensuring the quality of forest information is appropriate for decision making.

Impacts

- Improved knowledge communication and information exchange between political decision makers and forest data providers
- Improved coherence of support for forest-related policies

Innovations

- Analysis of the demand for and supply of forest-focused indicators
- Balance and gaps of the demand for and supply of forest-focused indicators

WP2 DIABOLO

MULTI-SOURCE INVENTORIES

WP 2 developed tools and methods to harmonise growing stock, biomass and carbon estimation and forest monitoring based on field data and high-resolution remote sensing data.

CO_2

$\sqrt{m^3}$
kg π

Impacts

- Harmonised and improved estimation of forest and wood resources for bioeconomy policies
- Results also for small regions

Innovations

- Methods and models to produce harmonized data and information on forest and wood resources
- Estimation procedures that combine National Forest Inventory (NFI) data and auxiliary information from remote sensing and maps

WP3 DIABOLO

IMPROVING DATA COLLECTION AND ANALYSES FOR MULTIPURPOSE INVENTORY OF FOREST RESOURCES

WP3 developed methods and harmonised indicators to estimate biodiversity and conservation status in different forest ecosystems, non–wood products production, stand susceptibility to windstorms, recreational activities, and fire risks.

Impacts

- Better information to plan multiple use of forest and risk management

Innovations

- New NFI based methods to assess
  - *non-wood forest products, biodiversity and social indicators*
  - *different forest risks*

Natura 2000

WP4 DIABOLO

MONITORING DISTURBANCES IN EUROPEAN FORESTS BASED ON SPACE DATA

WP4 yielded major improvements in continuous forest disturbance monitoring enabled by high temporal and spatial resolution of satellite data, calibrated time se–ries, and automatic production process.
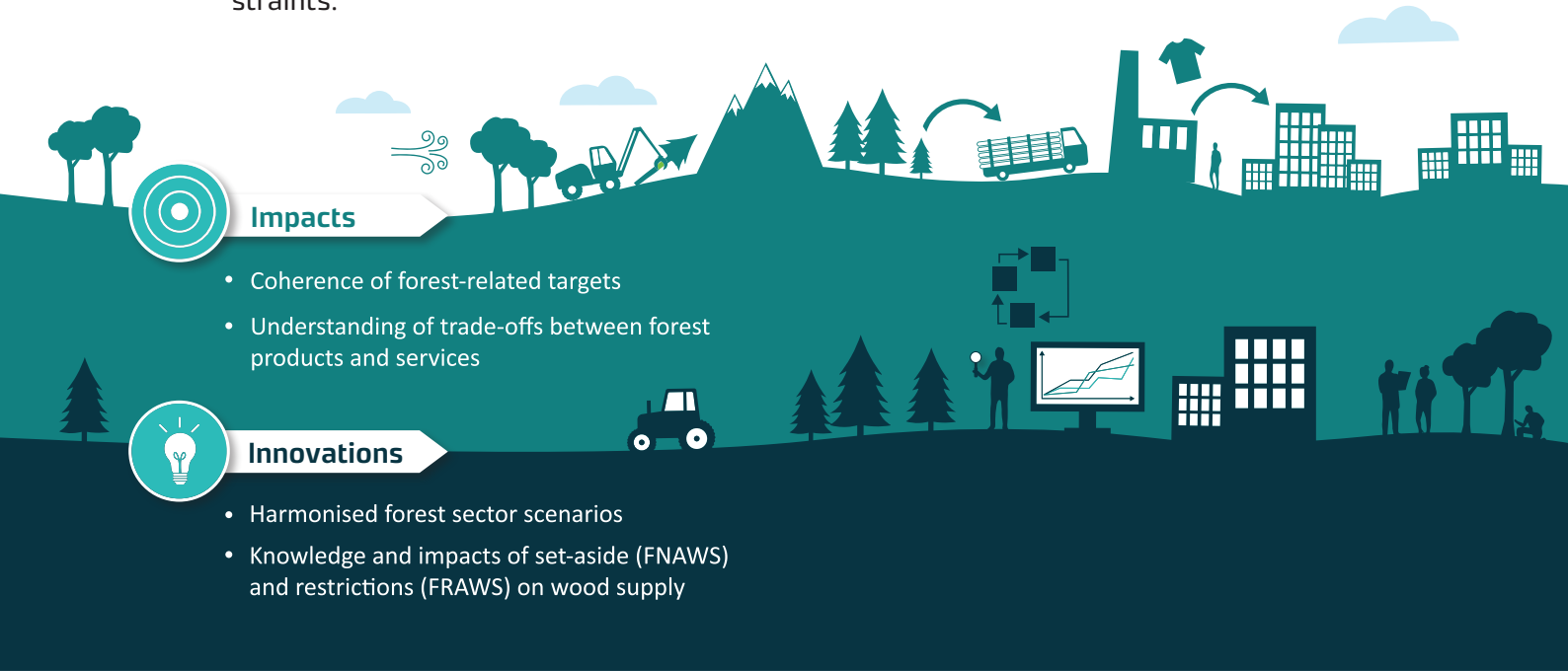
Impacts

- Rapid disturbance detection approach to provide information locally and regionally
- Decision support on disturbance management

Innovations

- Demonstrated methodologies for using Sentinel2 data
- Interactive tool based on expert field knowledge

MODEL-BASESD BIOMASS SUPPLY ANALYSES FOR BIOECONOMY

WP5 improved the applicability of European Forestry Dynamics Model (EFDM) for analyzing trade-offs between biomass supply and other ecosystem services through linking information about sustainability constraints.

Impacts

- Coherence of forest-related targets
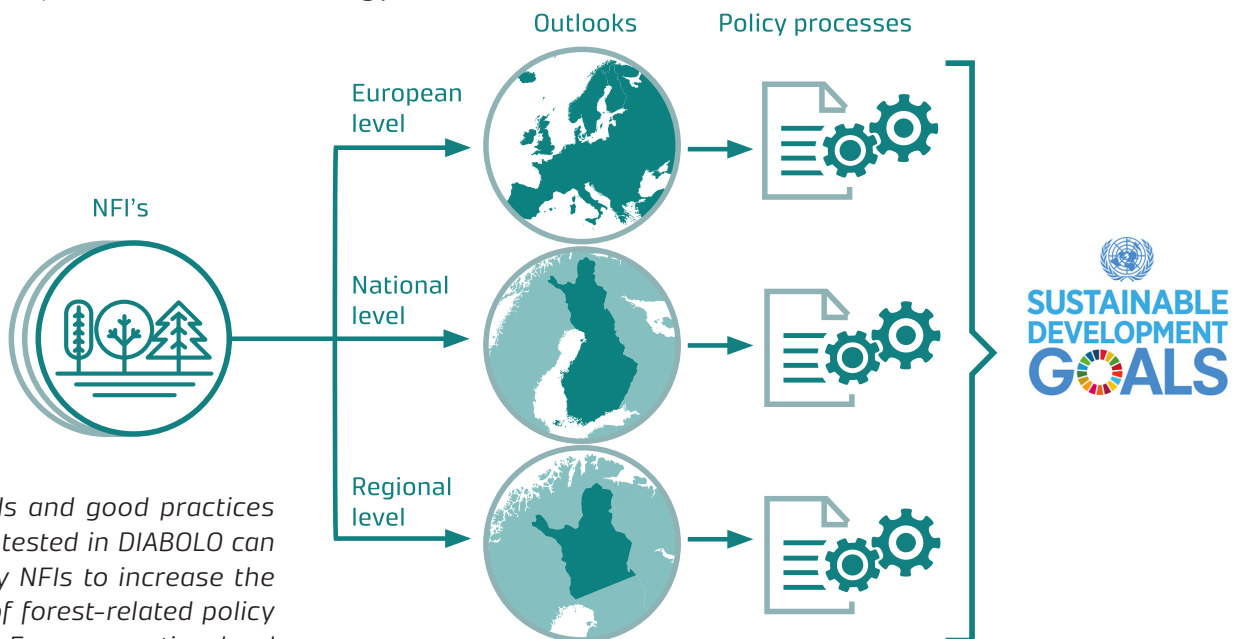- Understanding of trade-offs between forest products and services

Innovations

- Harmonised forest sector scenarios
- Knowledge and impacts of set-aside (FNAWS) and restrictions (FRAWS) on wood supply

EXPLOITATION POTENTIAL FOR THE DIABOLO RESULTS

NFI data supports evidence-based policy making at the European, national and regional level. NFIs can deliver timely long-term-data that is comparable over time and across the different EU Member States. Through research, innovation and technology we can improve the understanding of region-specific trade-offs between biomass supply and other ecosystem products and services.

Outlooks   Policy processes

European level

NFI's

National level

Regional level

SUSTAINABLE DEVELOPMENT GOALS

↑ The methods and good practices developed and tested in DIABOLO can be exploited by NFIs to increase the transparency of forest-related policy processes at the European, national and regional level.

POLICY RECOMMENDATIONS

- NFIs are regular, comprehensive and cost-efficient systems that are based on sound statistical designs - essential to fulfill the quality criteria of international forest monitoring and reporting processes.

- NFIs can deliver up-to-date forest information that is comparable over time and across the different EU Member States.

- The DIABOLO methods and models can be incorporated into NFIs for the production of evidence-based forest information for European, national and regional level.

- National level forest disturbance monitoring systems based on remote sensing could complement NFIs.

- The DIABOLO open source scenario tools and open science good practices can be used in forest-related policy and decision-making processes to increase transparency of outlooks.

- The DIABOLO methods, models and practices support the development of a sustainable and circular bioeconomy while addressing the SDGs.

- Further research is needed to improve understanding of region-specific trade-offs between biomass supply and other ecosystem products and services.
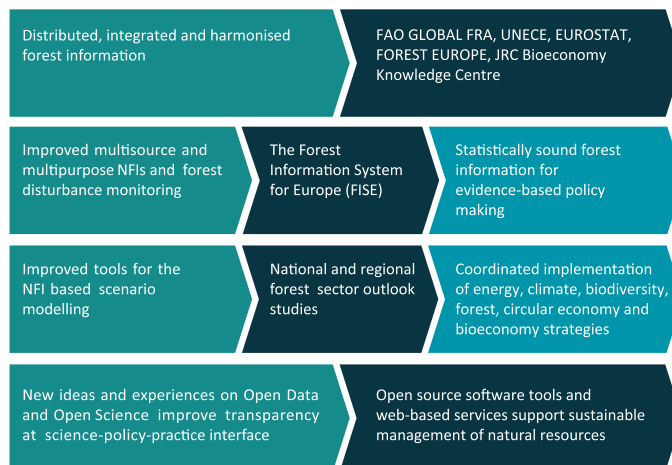
CONCLUSIONS

DIABOLO has produced a set of sound tools and methods to be exploited in decision making and policy making. It has provided:

- A more effective interface between science and policy (WP1)

- Methods and techniques to be shared within EN-FIN to be applied for national and international reporting (WP2)

- A wider scope of NFIs (WP3)

- Improved timeliness in forest disturbance monitoring (WP4)

- Better understanding of competition and conditions for balance between different forest land-uses (WP5)

DIABOLO

Distributed, integrated and harmonised forest information from National Forest Inventories (NFIs) for international reporting and policies

Distributed, integrated and harmonised forest information	FAO GLOBAL FRA, UNECE, EUROSTAT, FOREST EUROPE, JRC Bioeconomy Knowledge Centre

Improved multisource and multipurpose NFIs and forest disturbance monitoring	The Forest Information System for Europe (FISE)	Statistically sound forest information for evidence-based policy making

Improved tools for the NFI based scenario modelling	National and regional forest sector outlook studies	Coordinated implementation of energy, climate, biodiversity, forest, circular economy and bioeconomy strategies

New ideas and experiences on Open Data and Open Science improve transparency at science-policy-practice interface	Open source software tools and web-based services support sustainable management of natural resources

↑ *The results and innovations from DIABOLO contribute towards distributed and integrated production of statistically sound and harmonised data, as well as outlooks on forest resources and their use. When integrated with reporting, policy making and decision making at the European, national and regional level the results can support the development of a sustainable and circular bioeconomy while addressing the SDGs.*

FURTHER READING

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EUROPEAN COLLABORATION

↑ *Countries involved in DIABOLO (in green). Shaded countries contributed also as WP leaders.*

DIABOLO

Distributed, Integrated and Harmonised Forest Information for Bioeconomy Outlooks

- H2020 ISIB-4a project
- Duration: 3/2015 – 2/2019 (48 months)
- 120 scientists and experts
- From 25 European countries/National Forest Inventories (NFIs)
- Working in 33 organizations
- Budget 4,9 million EUR

COORDINATOR

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WP 6   – Mr Charles Harper, UCD, Ireland

Deceased in 2017

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