SECTOR

Production of Solid Sustainable Energy Carriers from Biomass by Means of TORrefaction

Deployment scenarios for torrefaction based solid bioenergy carriers

A European R&D Project funded within the Seventh Framework Programme by the European Commission

Fachgespräch Bioenergieforschung
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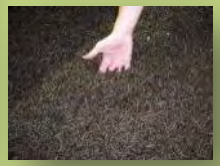

This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement n° 282826

Outline

- Introduction
  - renewable energy deployment and biomass
- Objectives
  - of the SECTOR project
  - of this study
- Methodology
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- Results
  - Scenarios
- Conclusions

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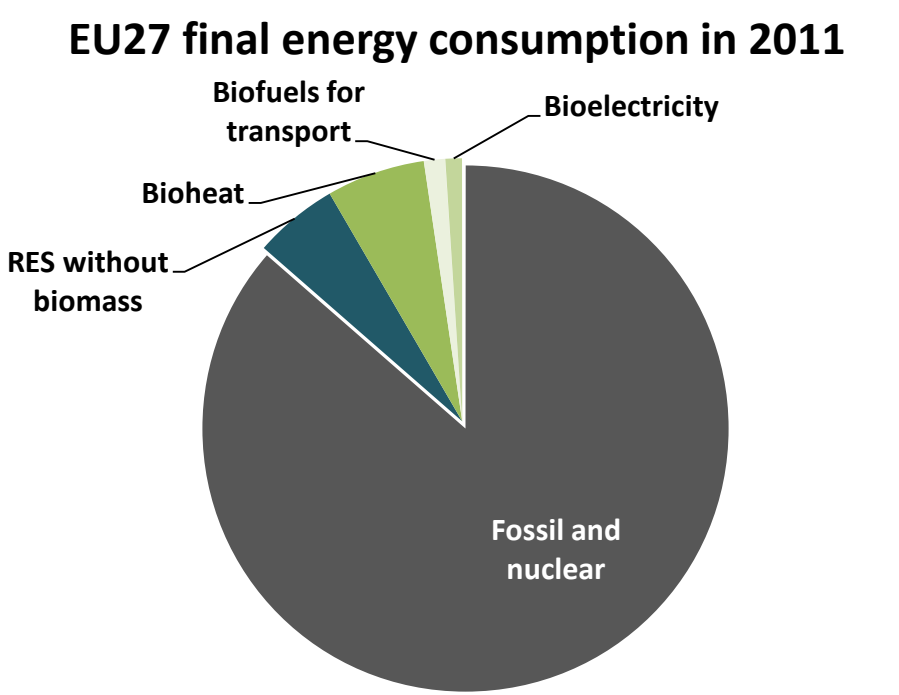
Introduction



Source: AEBIOM, European Bioenergy Outlook 2013, own illustration

Biomass for energy
- from forestry
- Energycrops
- Waste
- Aquatic biomass

Preparation of biomass
- Mechanical
- Thermal
- Bio-, thermo- & chemical

Bioenergy carrier
- Solid
- Liquid
- Gaseous

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Objectives

Of the EU 7th Framework Programme SECTOR-project
„to advance the state of the art of torrefaction as one of the major technologies to achieve the EU renewable energy targets“

Of this presentation
Assessment of the role of torrefaction-based solid bioenergy carriers in the biomass-to-end-use chains and their contribution to the development of the bioenergy market in Europe

Assessment of (dis-) advantages of torrefied pellets compared to traditional (white) pellets

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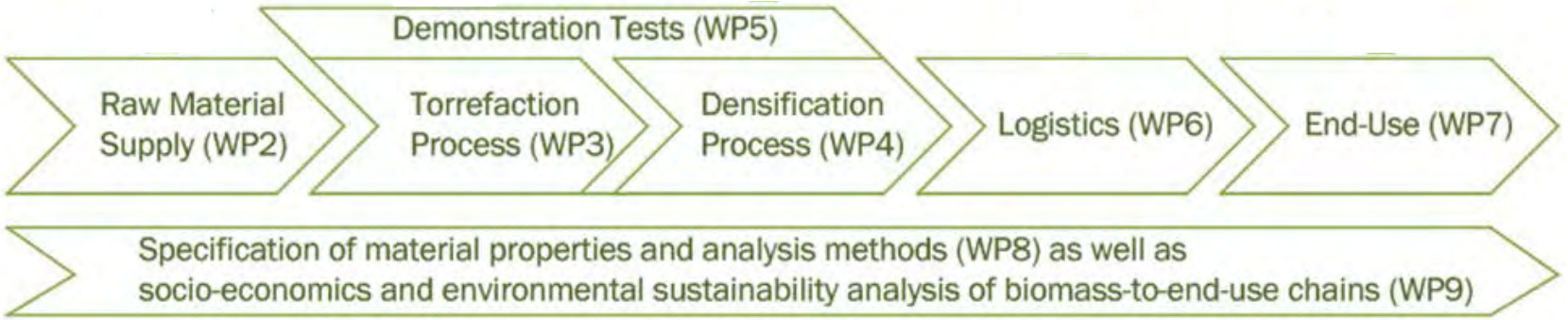
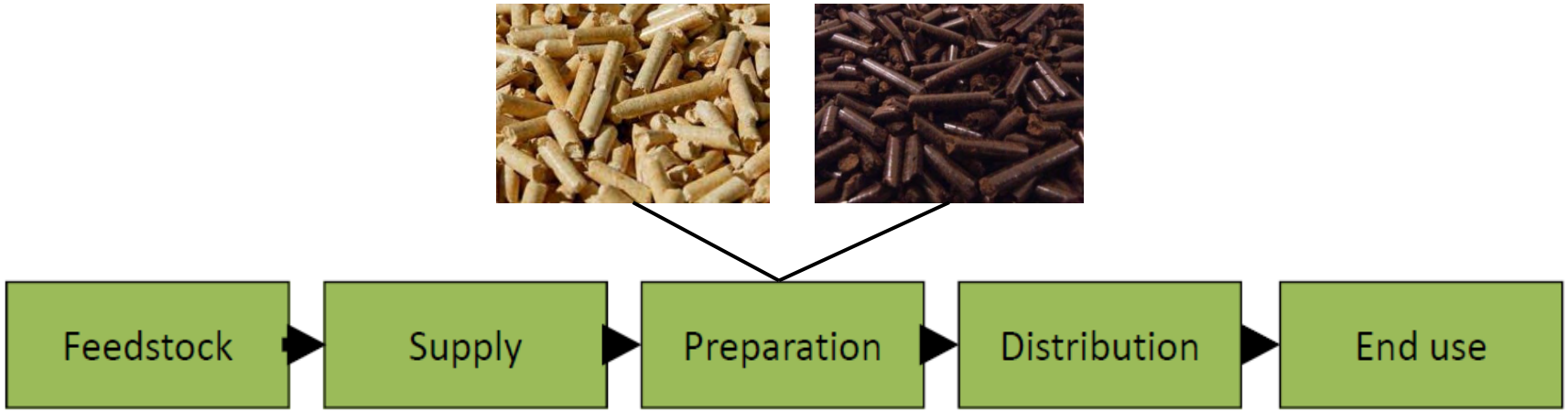
Methodology



gathering and processing experimental data and estimations
computation of permutations in BioChainS tool



Scheme of biomass-to-end-use chain

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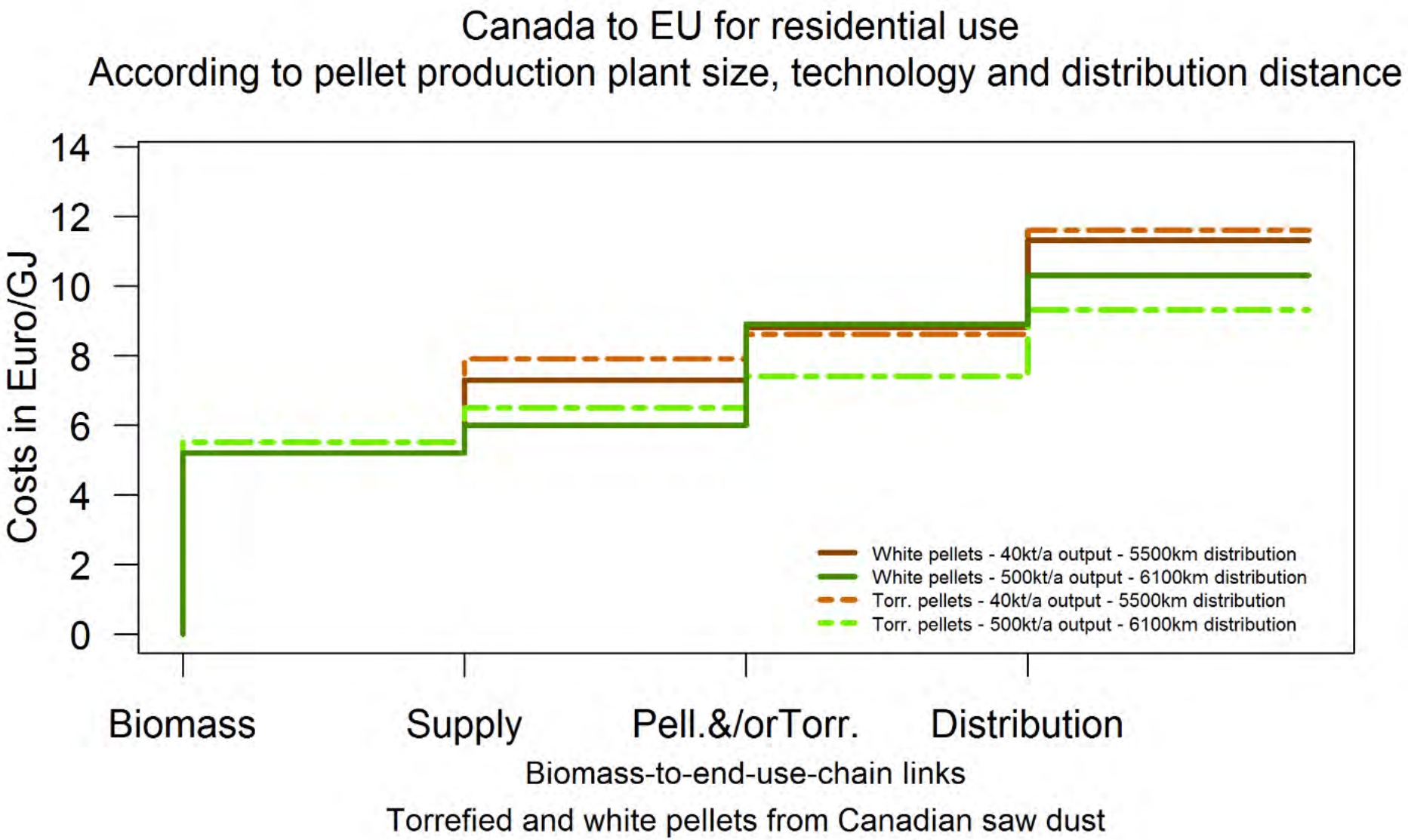
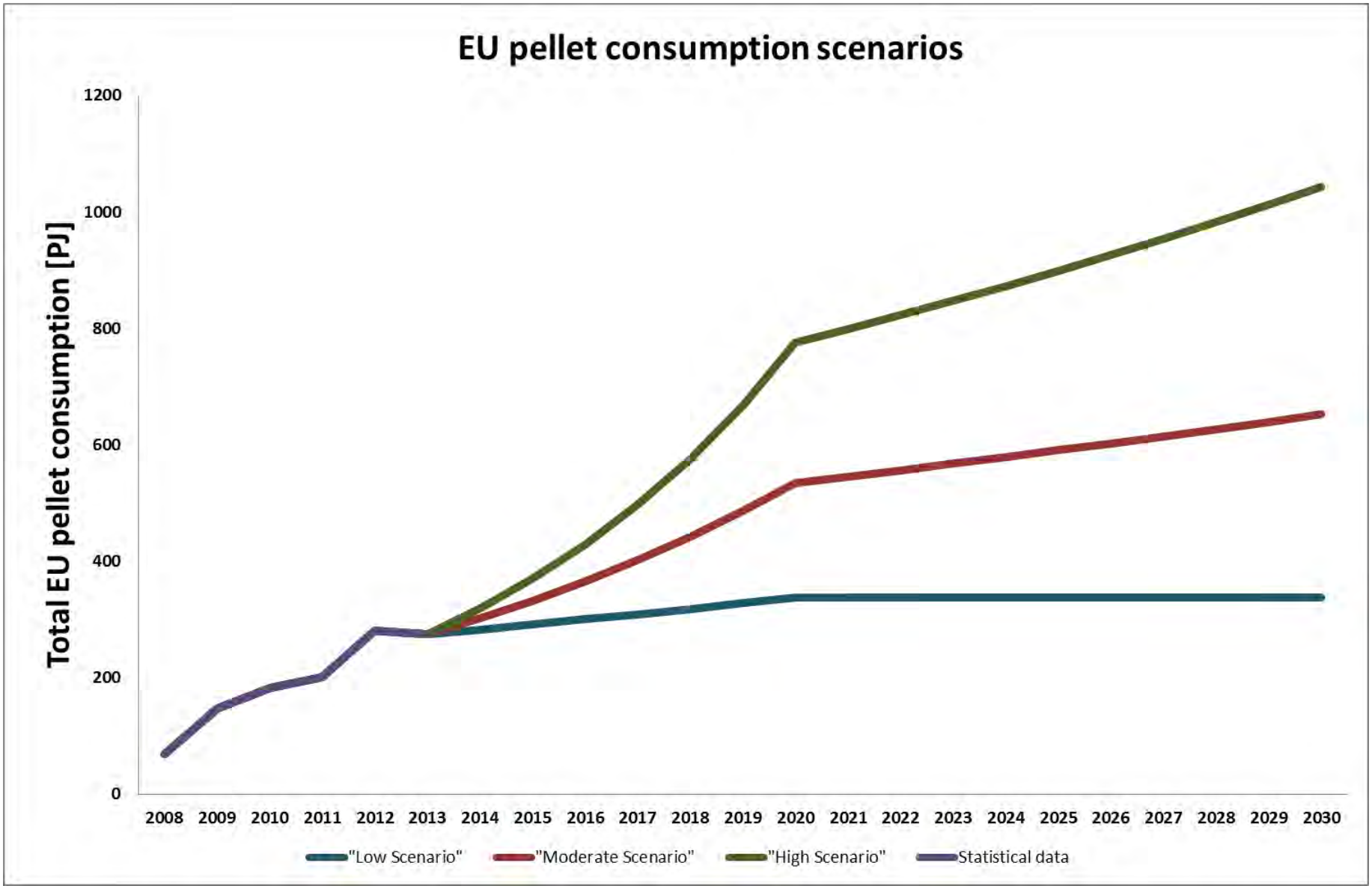
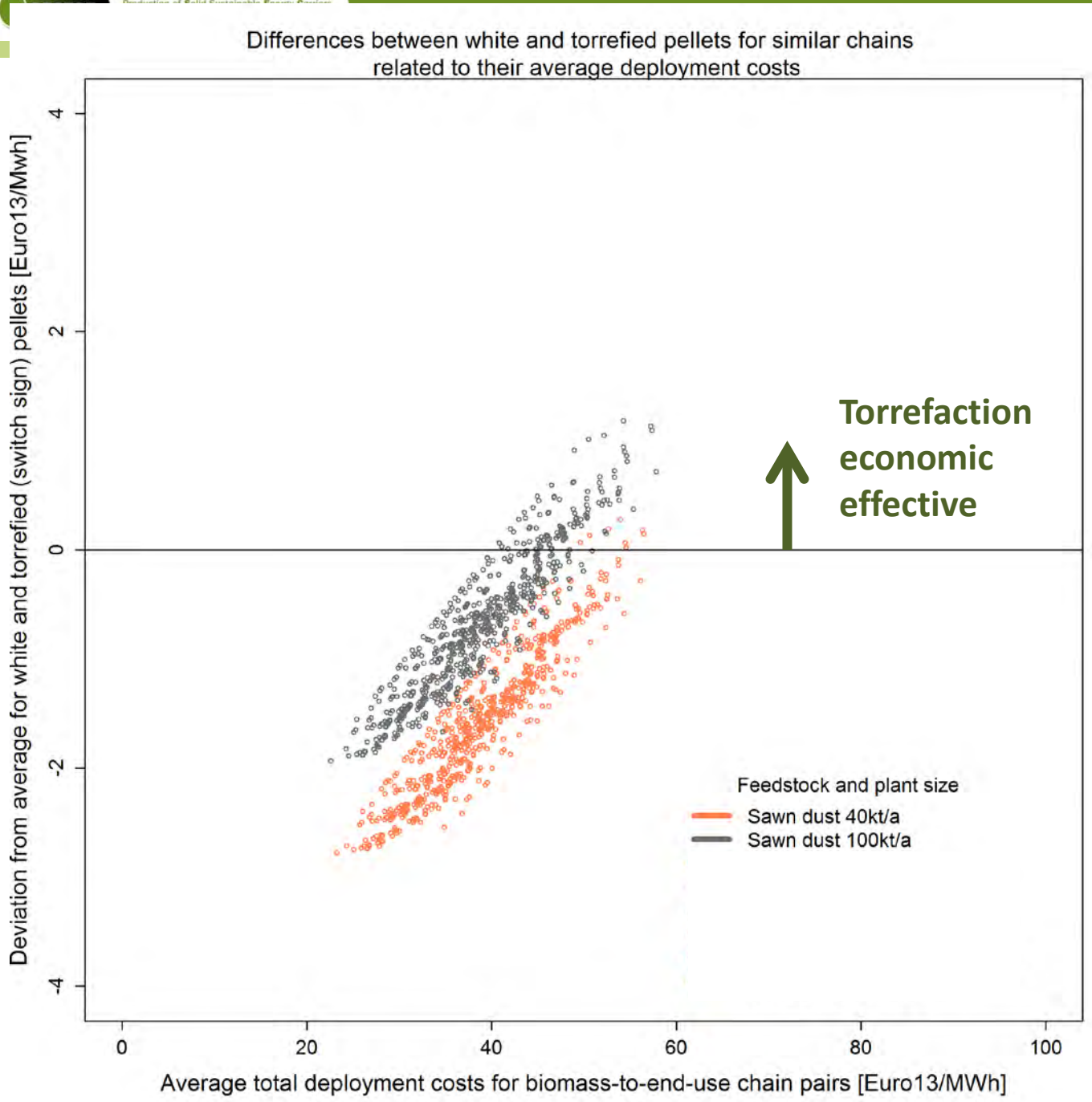
Methodology – biomass-to-end-use chain simulation



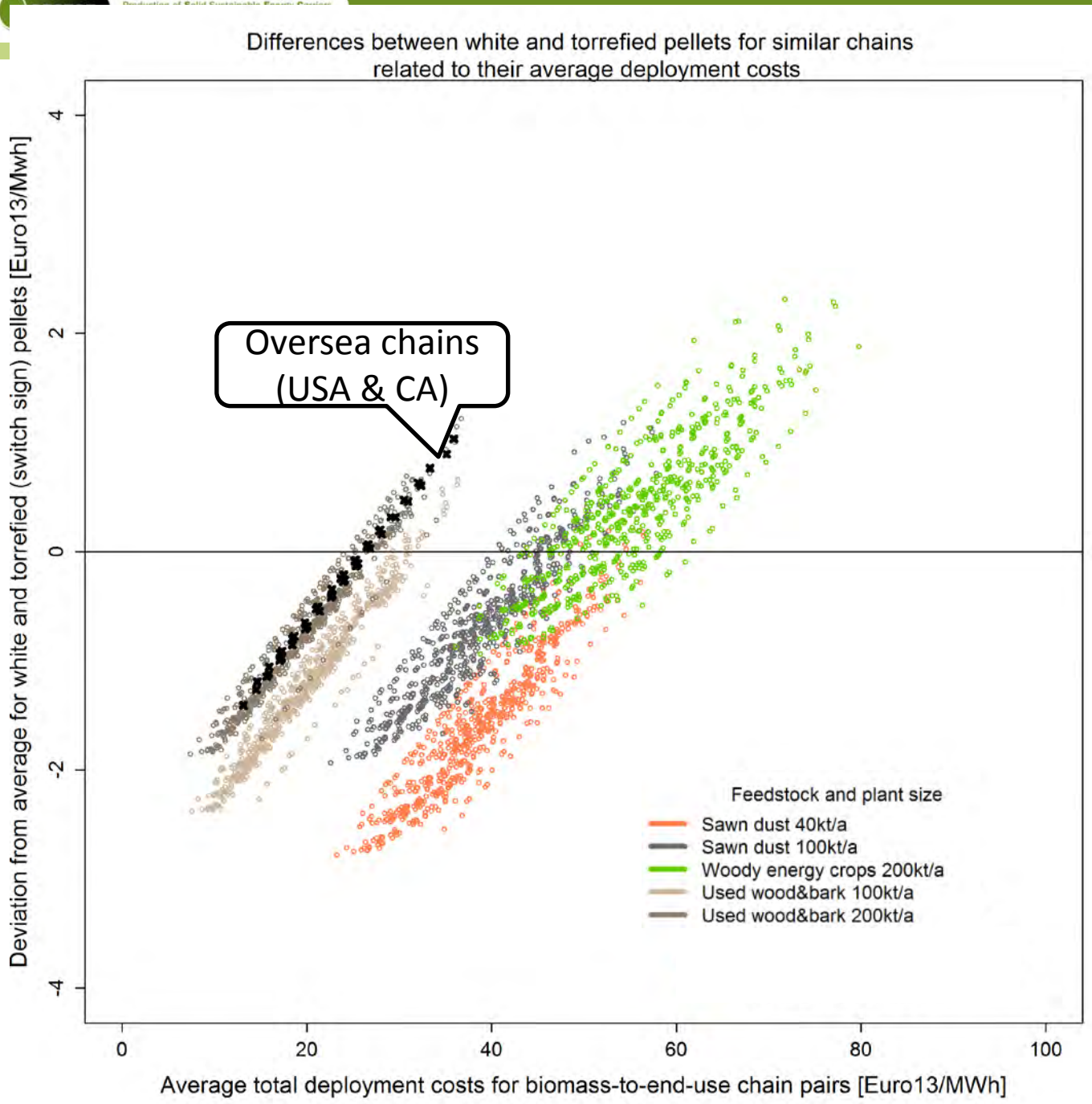
Statistical pellet consumption and own scenarios based on literature scenarios





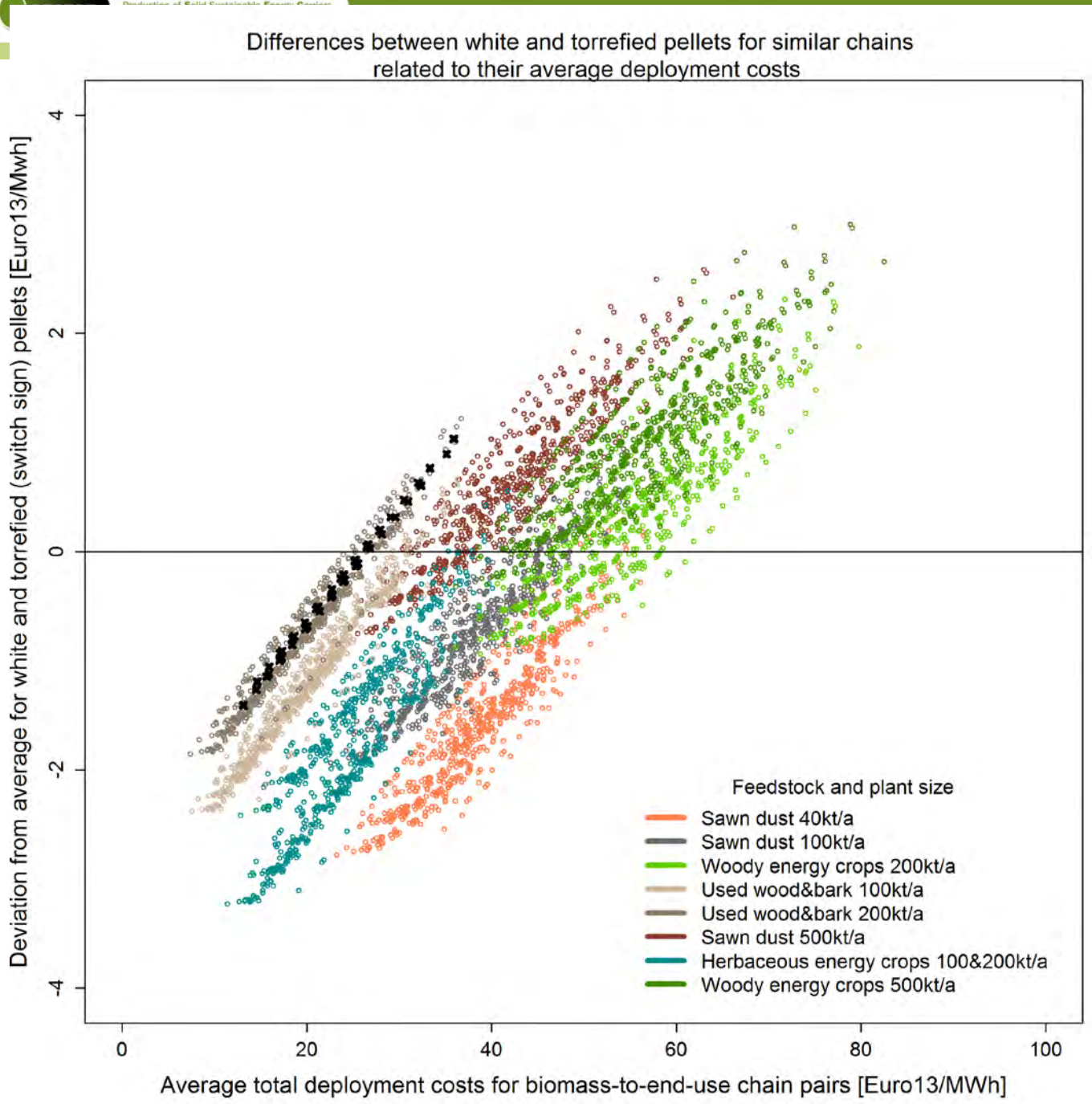
„Low scenario“

.) Using domestic sawn dust potential



„Moderate scenario“

.) Pellet import
.) additional feedstock for small scale (stem wood)
.) additional feedstock for large scale (used wood)



„High scenario“

.) Pellet imports
.) additional feedstock for small scale (stem wood)
.) additional feedstock for large scale (used wood, straw and sunflower husks)
.) larger pellet plants

Conclusions - selection

- Similar costs for torrefied and white pellets can be achieved
  -> bioenergy product portfolio **can be enhanced**

- Thermally upgrading of **herbaceous biomass** does not lead to considerable advantages

- Higher energy densities lead to advantages for **long distance trade**
  increasing demand -> increasing pellet trade -> increasing torrefaction share

- **Similarity with coal** (grindability, hydrophobicity, higher heating values than traditional) makes it an interesting option for industries

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thank you very much for your attention

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