WP 1-2-3

**WP1**
- Stimulating sustainable production, collection and preparation of biomass

**WP2**
- Conversion and utilisation of biomass to energy

**WP3**
- Sustainability assessment and strategy development
WP 1: Stimulating sustainable production, collection and preparation of biomass

- Lead: POM & PIVAL (West-Flanders)
- Focus:
  - Availability and supply of biomass
  - Adjusting supply and demand
  - Specific types of biomass:
    - Agro side streams
    - Waste of local authorities
    - Waste of industry
    - Low Impact Energy Crops
WP1 actions:

- Action 1: Establishment of the necessary platforms for transnational cooperation and dissemination
- Action 2: Benchmark report on biomass for bio-energy in NWE
- Action 3: Development of agro-side streams for bio-energy
- Action 4: Development of closed loop systems of biomass valorization by local authorities
- Action 5: Development of synergy parks
- Action 6: Development of low-impact energy crops
WP 1 Production, Collection and Preparation of biomass

- **Action 1: Establishment of the necessary platforms**
  - Transnational Taskforce (TTF)
    - 1 TTF for the project
    - Guidance for all actions in the project, in particular the pilots
    - Guarantees transnational exchange of knowledge between the participating regions
  - Composition:
    - Project partners
    - External experts and stakeholders
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- **Action 1: Establishment of the necessary platforms**
  - National Taskforce (NTF)
    - In each project region
    - Guarantees the transfer and exchange of knowledge within the regions
    - Serves as a local steering group
    - Allows project sponsors and stakeholders to follow up the global project and the specific actions/pilots within the region
  - Composition
    - Project partners
    - Project sponsors
    - Regional Stakeholders
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- **Action 1: Establishment of the necessary platforms**
  - Transnational Advisory Board (TAB)
    - Instrument for the development and implementation of the regional strategies within action 14
    - Composition
      - Regional biomass stakeholders
      - Observers and biomass experts
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- **Action 1: Establishment of the necessary platforms**
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- **Action 2: Benchmark Report "biomass for bio-energy within the NWE region"**
  - Consensus at European level on advantages of biomass for bio-energy
    - It diversifies the energy supply.
    - It replaces high CO2-emitting conventional fuels.
    - It helps recycle waste.
    - It protects and creates jobs in rural areas.
    - It extends the EU’s technological leadership in bio energy.

![Primary energy production from renewable energy sources, breakdown by individual source (EU-27, 2008)](image-url)
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- **Action 2:** Benchmark Report "biomass for bio-energy within the NWE region"
  - National Renewable Energy Action Plans (NREAP)

![Renewable energy share comparison](http://www.ecn.nl/nreap - 1 February 2011 (European Union, EU-27))
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- Action 2: Benchmark Report "biomass for bio-energy within the NWE region"
  - Action in all project regions

- Context:
  - Baseline and targets are defined but how to reach these renewable energy targets?
  - Common challenge for all regions, different approaches (background for all Arbor actions)

- Aim:
  - Comprehensive state-of-the-art assessment on the use of biomass for bio-energy in the project regions
    - Overview of statistics on availability and use of biomass
    - Overview of relevant (EU-) projects on biomass for energy
    - Analysis of European, national and regional strategies on use of biomass for energy
    - Analysis of regional differences on legal status of specific types of biomass (waste)
    - Focus on innovative concepts already in place or under development
  - Update of the benchmark report at the end of the project
    - Evolution in statistics and policy
    - Overview of the project results
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- **Action 3 : Development of agro-side streams for bio-energy**
  - Action in West-Flanders (Be)

  - **Context:**
    - While producing crops, often only a part of the plant is harvested, the rest stays on the field or is removed as waste.
    - Some of this waste has an important function in maintaining soil fertility.
    - Other streams are undesired because of nitrogen leakage, smell, survival of plant disease, ... .

  - **Aim:**
    - Development of concepts to valorize different types of agro-side streams for bio-energy taking into account:
      - technical and logistical challenges to collect and conserve the biomass
      - best pre-treatment and conversion techniques
      - impact on the agricultural production system and on the environment
    - Implementation of these concepts at pilot-level.
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- **Action 3 : Development of agro-side streams for bio-energy**
  - **Pilot 1: Valorization of straw of maize**
    - Up to 7 – 8 tons DM/hectare?
    - Important source of organic matter for the soil
  - **Pilot 2: Valorization of stems of Brussels sprouts**
    - 2 to 3 tons DM/hectare?
    - Left on the field, source of undesired high amounts of nitrogen in winter
  - **Pilot 3: Valorization of leaves of leek**
    - 2 to 3 tons DM/hectare?
    - Produced on farm, return to field undesired because of nitrogen, smell, diseases
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Action 4: Development of closed loop systems of biomass valorization by local authorities

- Action in Stoke-on-Trent (UK), Saarland (Du) and Utrecht (NI)

Context:
- Local authorities in NWE are dealing with quite large amounts of biomass from maintenance of landscape, verges, as municipality waste, as sewage sludge, ...
- Dealing with this biomass results in large expenses for the authorities

Aim:
- To demonstrate concepts of valorization of biomass from the community, by the community and for the community
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- Action 4: Development of closed loop systems of biomass valorization by local authorities
  - Pilot 1: Woody biomass valorization in Stoke-on-Trent
    - 1380 ha of parks and open spaces = 750 tons / year
    - + local tree surgeons (2240 t/y), forestry holdings (33000 t/y), waste wood recyclers (7000 t/y)
    - Feasibility studies on processing plant and energy plant
    - Investment
  - Pilot 2: Valorization of grass from verges in Province of Utrecht
    - explore the possibilities to create a system to collect roadside grass
    - bring in a new technique: dry digestion at composting facilities
    - upgrade the biogas to biomethane ("greengas")
    - facilitate a biogas-hub at which several producers of biogas can connect to upgrade the biogas together to biomethane (Investment)
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- **Action 4:** Development of closed loop systems of biomass valorization by local authorities

  - **Pilot 3:** Valorization of organic waste and sewage sludge in Saarland
    - Current system exports organic waste to different parts of Germany because of public tenders (economical reasons)-mainly conversion in composting plants
    - No energetically value, nor regional added value for Saarland, and worse ecological (CO$_2$) impact in current systems

  - **Pilot 4:** Valorization of greenery cuttings and landscape material in Bliesgau
    - Bliesgau is under UNESCO biosphere protection
    - Analyse the possibilities for developing a sound concept for nature protection and valorization of energetical biomass
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- **Action 5 : Development of Synergy Parks**
  - Action in West-Flanders (Be) & Gelderland(Nl)

- **Context:**
  - Large biomass potential of waste streams
  - Added value in synergies between industry and agriculture
  - Shorter supply chain by local valorization of biomass
  - Parkmanagement approach

- **Aim:**
  - To optimise the valorization of available biomass
  - To develop local biomass synergies
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- **Action 5 : Development of Synergy Parks**
  - Pilot 1: West-Flanders
    - Location soon defined
  - Pilot 2: Betuwse Bloem
    - Regionally grouped horticultural growers with a track record of CHP-stations, want to upgrade esp concerning energy, assessing biomass alternatives.
  - Pilot 3: Groot Zevert, Beltrum
    - Realizing regionally sourced fermentation, and green gas supply to Friesland Campina facilities.
  - Pilot 4: Norske Skog Parenco
    - Biobased business development related to paper mill.
  - 5th pilot possible
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- **Action 6 : Development of low-impact energy crops**
  - Action in West-Flanders (Be) & Zeeland (Nl)

- **Context:**
  - Agriculture will be a very important source of biomass for energy in Europe
  - Energy crops do have a potential pressure on farmland biodiversity
  - Public debate concerning Food versus Fuel

- **Aim:**
  - To search opportunities of combining biomass production for energy with other functions
  - To demonstrate concepts of such ‘low-impact’ energy crops
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- **Action 6 : Development of low-impact energy crops**
  - Pilot 1: Multifunctional Short Rotation Coppice
    - SRC & biodiversity/nature conservation
    - SRC & agroforestry
    - SRC & buffering on industrial sites

- Pilot 2: Biomass buffer stripes
  - Bufferstripes are an important tool to protect water resources and biodiversity
  - Combining soil conservation, water quality improvement, biodiversity & biomass production for energy?
  - Eg in Zeeland (NL): 500 hectares of bufferstripes
Action 6 : Development of low-impact energy crops

Pilot 3: Harvesting biomass from marginal land or non-used land
- Biomass from treatment wetlands: reed
- Biomass from contaminated land: fytoremediation
  more specific in ‘Vlaamse & Nederlandse Kempen’ 700 km² is contaminated with heavy metals

Pilot 4: Biomass from cover crops
- Explore the potentials of producing biomass during winter
- With respect to the functions of cover crops:
  soil conservation, supply of organic matter to the soil,
  prevention of nutrient leakage to water resources
- With limited risks for yield reduction in main crop