ENEA
ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES, ENERGY AND SUSTAINABLE ECONOMIC DEVELOPMENT

SAHYOG

SEVENTH FRAMEWORK PROGRAMME

Strengthening networking on biomAss researcH and biowaste conversion – biotechnologY for EurOpe India inteGration

Neeta Sharma, Coordinator SAHYOG
ENEA Research Centre, Italy

SAHYOG Stakeholder Workshop,
Copenhagen, Denmark, 6 June 2013

ENEA - RESEARCH CENTRES

ENEA Italian National Agency for New Technologies, Energy and Sustainable Economic Development

ENEA's activities are targeted to "research, innovation technology and advanced services in the fields of energy and sustainable economic development".

FACT SHEET SAHYOG

- Type of funding scheme: **Coordination Action**
- Topic Code: FP7-KBBE. 2011.4-05: **EU - India Partnering Initiative** on biomass production and biowaste conversion through biotechnological approaches - Mandatory India - Call: FP7-KBBE-2011-5
- Project duration: 3 years (December 2011–November 2014)
  Kick-off meeting: January 2012
- 13 partners in the SAHYOG consortium

Website: http://www.sahyog-europa-india.eu/

PROJECT CONSORTIUM

1. Italian National Agency for New Technologies, Energy and sustainable Economic Development (ENEA), Italy
2. Ministry of Economic Affairs, Agriculture and Innovation (NL Agency), Holland
3. Deutsches Zentrum Fuer Luft - Und Raumfahrt Ev (DLR), Germany
4. Wageningen University & Research Centre Food & Biobased Research (WUR)
5. Vlaamse Instelling voor Technologisch Onderzoek (VITO), Belgium
6. Wirtschaft Und Infrastruktur GMBH & Co Planungs KG (WIP), Germany
7. National Technical University of Athens (NTUA), Greece

8. The Energy and Resources Institute (TERI)
9. Council for Scientific & Industrial Research (CSIR/IICT)
10. GB Pant University of Agriculture & Technology (GBPUAT), Pantnagar,
11. Tezpur University (TU), Assam
12. Appropriate Rural Technology Institute (ARTI), Pune
13. Jawaharlal Nehru University (JNU), New Delhi

Sub-contractor EPSO - European Plant Science Organisation

SAHYOG Funding

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and

by the Department of Biotechnology (DBT) of the Indian Ministry of Science and Technology.

Department of Biotechnology
Ministry of Science & Technology,
Government of India

SEVENTH FRAMEWORK PROGRAMME

Indian partners follow different financial guidelines according to the Indian government rules.

OBJECTIVES

The main aim of India Partnering Initiative is to map out what the European Union and its Member States could do together with India to find solutions to challenges/needs – to help accelerate economic and sustainable development in both regions.

Activities: The SAHYOG plans a major coordination approach, split into 5 work packages. Each WP have one leader from both the EU and India.

PROJECT HIGHLIGHTS

✓**Bring together the leading organisations** in the field of biomass production and bio-waste conversion research, carried out on one side by the European research programmes (EU Framework Programmes and EU Member State's national programmes) as well as by related research programmes coordinated by Indian national institutions.

✓**An inventory** of the **biomass and bio-waste potentials** and **existing research projects** is planned to be prepared and analysed during the activity. These inventories will be the basis for the **joint Strategic Research Agenda.**

✓Broad **networking** of respective scientific communities, **twinning** of large sets of research projects, **short term exchange** visits of researchers.

✓A **roadmap** will be prepared through consultation with stakeholders at the governmental, research and industrial level that will present a concerted planning of future research initiatives in this area.

WP2 - INVENTORIES

Objective: to bring together the available databases existing both in EU & India, leading to a detailed inventorisation of resources & scientific interventions and understanding the current bottlenecks.

- **Biomass & Biowastes**
- **Existing Research Projects & Programs**

Indispensible tool for all work to be performed to prepare the Roadmap for the SRA that will be used as main cooperation tool to fill in the gaps for biotechnology interventions

- ***The focus on inventories so far has been limited mainly to Bioenergy. SAHYOG wants to make it more broad based***

Results on SAHYOG Inventories

Main database sources and recent reports consulted for Biomass Inventories

1. The NREAP (The National Renewable Energy Action Plans, Biomass use in EU27), templates as a base for the SAHYOG inventories - extended with other relevant biomass sources.

2. IPCC SRREN report which gives a realistic projection for the global biomass scenario (http://srren.ipcc-wg3.de/report).

3. EUBIONET III (2005-2007 - updated in 2009 only for few countries)

4. AEBIOM – updated report 2012 with data of 2010 based on nREAP data –(data similar with the data reported in BIOMASS FUTURE)

SAHYOG - Main Database Sources and Recent Reports

5. **BIOMASS FUTURES** project - comparison of biomass resource assessment studies is based on the results of the **BEE project**;

SAHYOG - Main Database Sources and Recent Reports

6. Nova Institute Report published in Feb. 2012 on data on biomass and industrial use in tons; cat used not similar to SAHYOG database.

7. For Greece, data is mainly taken from the national project reports and EUBIONET with Greece as a partner.

8. For other European countries, some recent national project reports have also been consulted.

Main Database Sources and Recent Reports -India

- Non-availability of central databases for biomass resources in India - major limitations,

- available information in various formats and focused mostly on the production and yield of various agricultural and plant products,

- limited to academic reports and publications but it was specific to the objective of that study or limited to local or regional levels.

Considering these limitations, the inventory was prepared by considering certain extrapolations on the data from the available sources.

Biomass Inventories

Biomass Resources

- ✓ Forests
- ✓ Agriculture & Fisheries
- ✓ Wastes

Biomass from Forests (EU)

1. **Direct supply of wood biomass from forests and other wooded land** includes:

- Fellings
- Residues from fellings (tops, branches, bark, stamps)
- Landscape management residues (woody biomass from parks, gardens, tree rows, bushes)
- Others

Biomass from Forests (EU)

2. Indirect supply of wood biomass includes:

- Residues from sawmilling, woodworking, furniture industry (bark, sawdust)
- By-products of the pulp and paper industry (black liquor, tall oil)
- Processed wood-fuel
- Post consumer recycled wood (recycled wood for energy generation, household waste wood)
- Others

Biomass from Agriculture and Fishery (EU)

1. **Agricultural crops and fishery products** directly provided for energy, materials and chemical production includes:

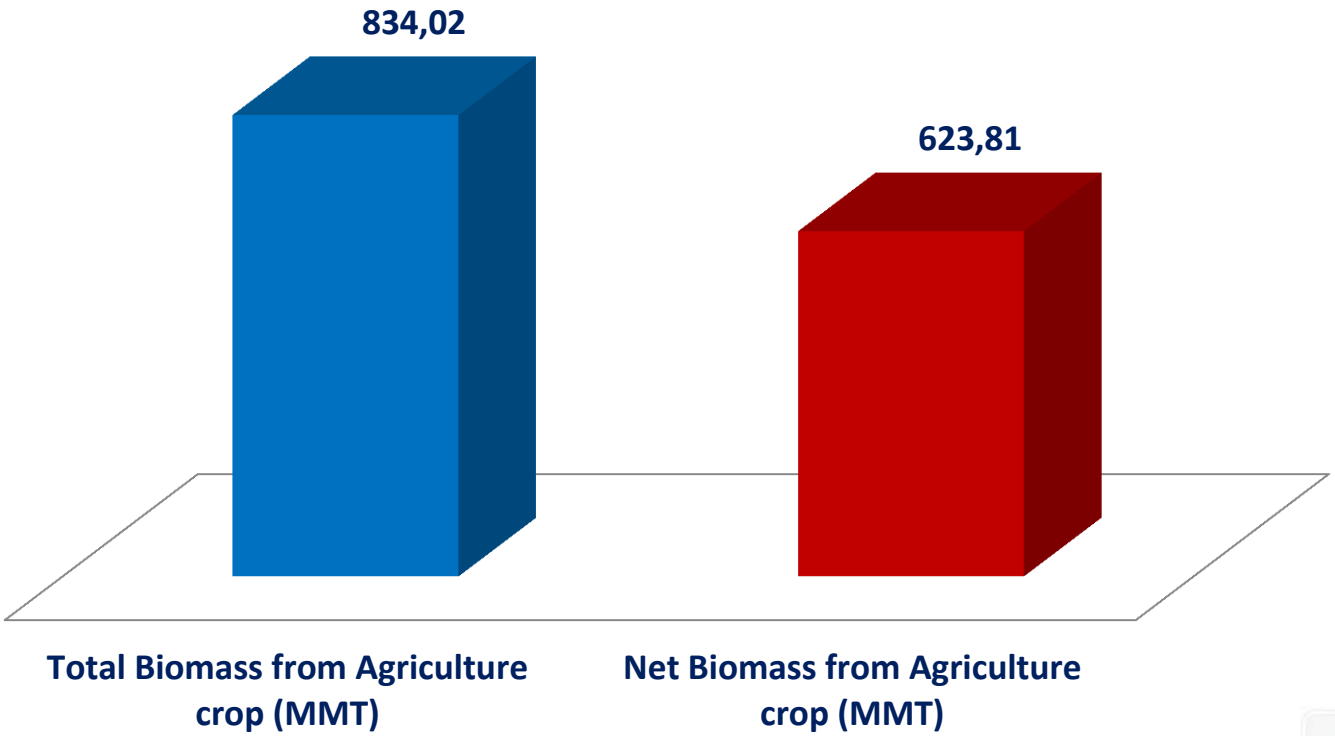
- dedicated biomass crops (grasses)
- oil crops
- sugar crops
- starch crops
- short rotation trees
- algae
- sea weeds
- other

Biomass from Agriculture and Fishery (EU)

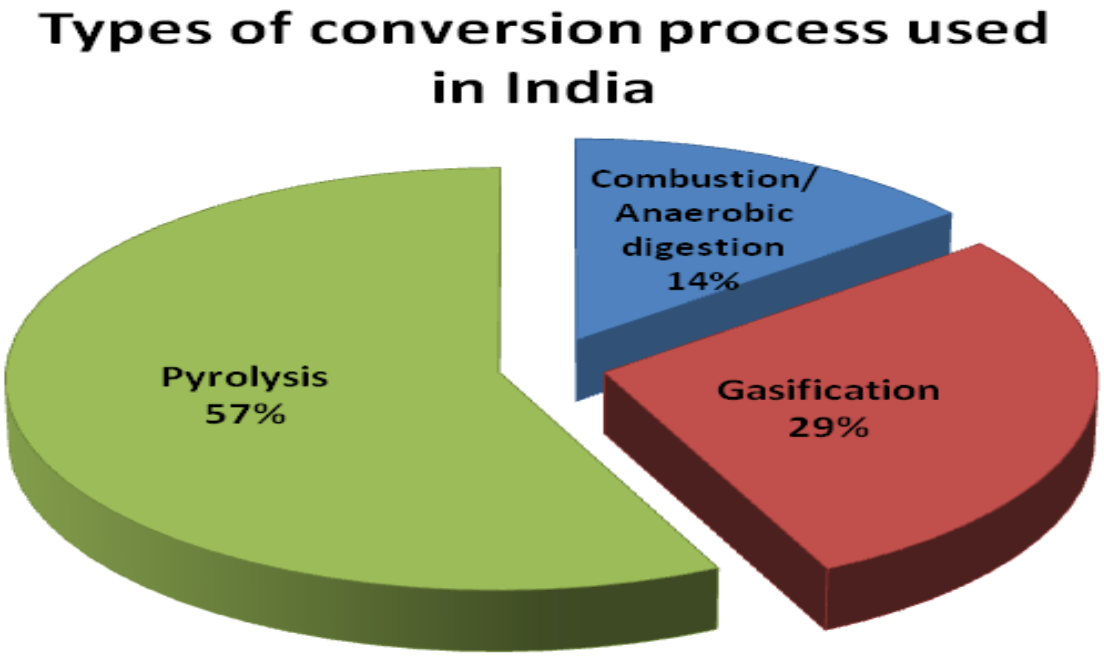
2. Agricultural by-products/processed residues and **fishery by-products** for energy, materials and chemicals production includes:

- Straw
- Waste oils
- Animal fats
- Manure
- Meat and bone meal
- Cake by-products (incl. Oil seed and olive oil cake for energy)
- Fruit biomass (including shell, kernel)
- Fishery by-products
- Clippings from vines, olives, fruit trees
- Other

Total Biomass from Agricultural crop - India



Biomass in India

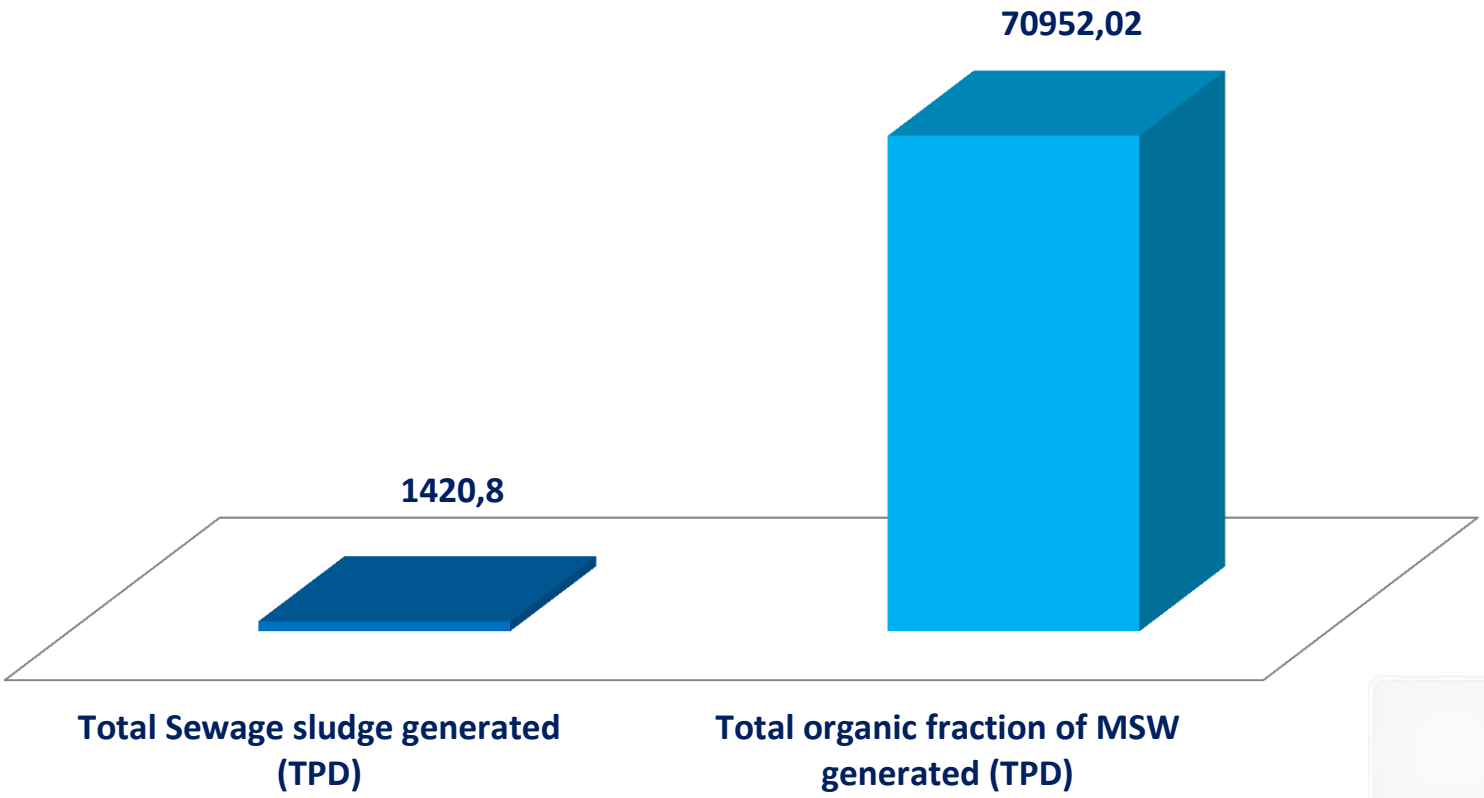


Biomass from Waste Resources (EU)

1. **Biowastes** including biodegradable fraction of municipal solid waste including biowaste (biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants and others).
2. **Biodegradable fraction of industrial waste** including paper, cardboard, pallets.
3. **Sewage sludge**
4. **Landfill gas**

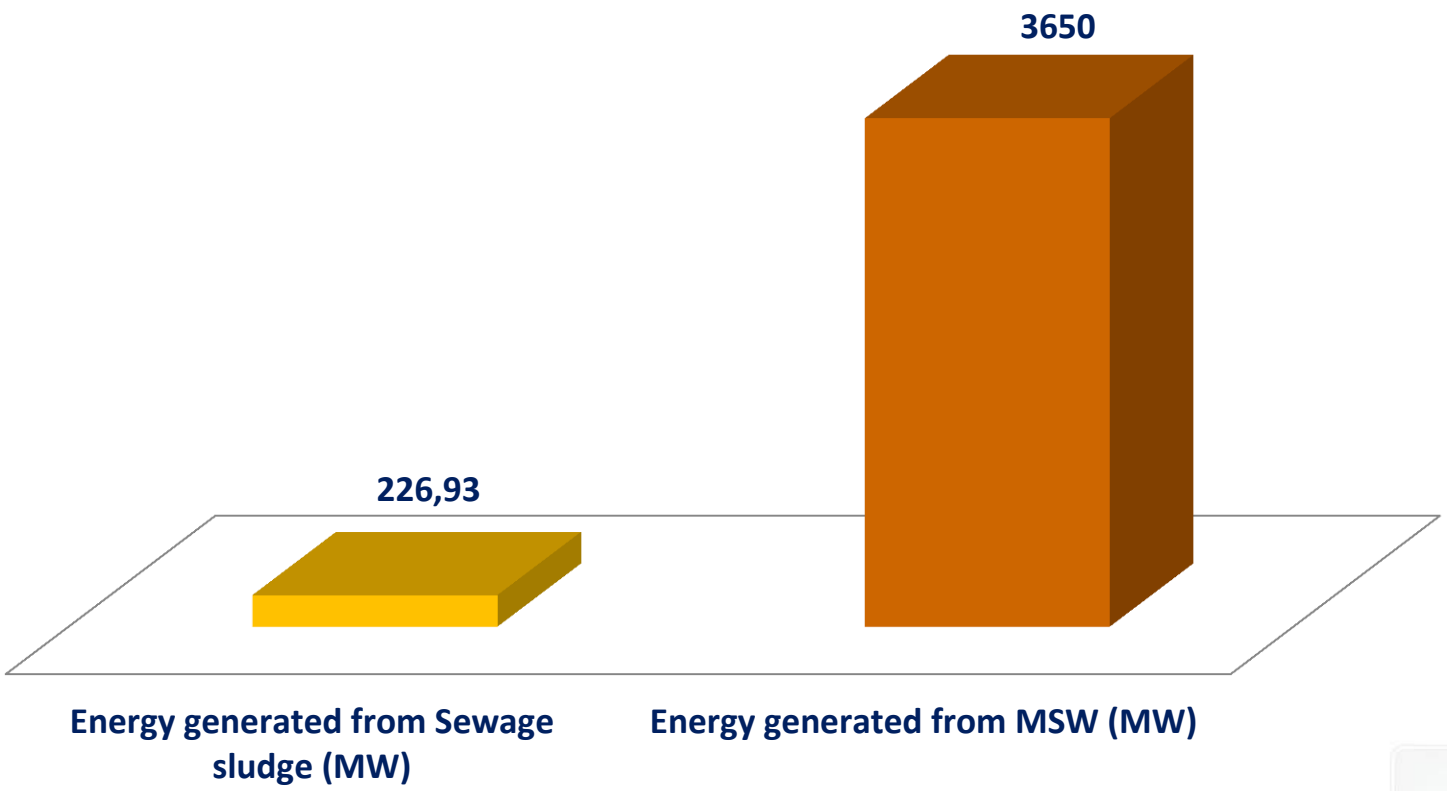
Biomass from Wastes - India

Biomass from Waste



Biomass from Wastes - India

Biomass from waste (MW)



Total Biomass power from waste - 3876.93 MW

Biomass Resources in EU 27

EU Aggregate data

Only 40% of 27 EU MS inventories are complete for total available aggregate data (tons/m^3)

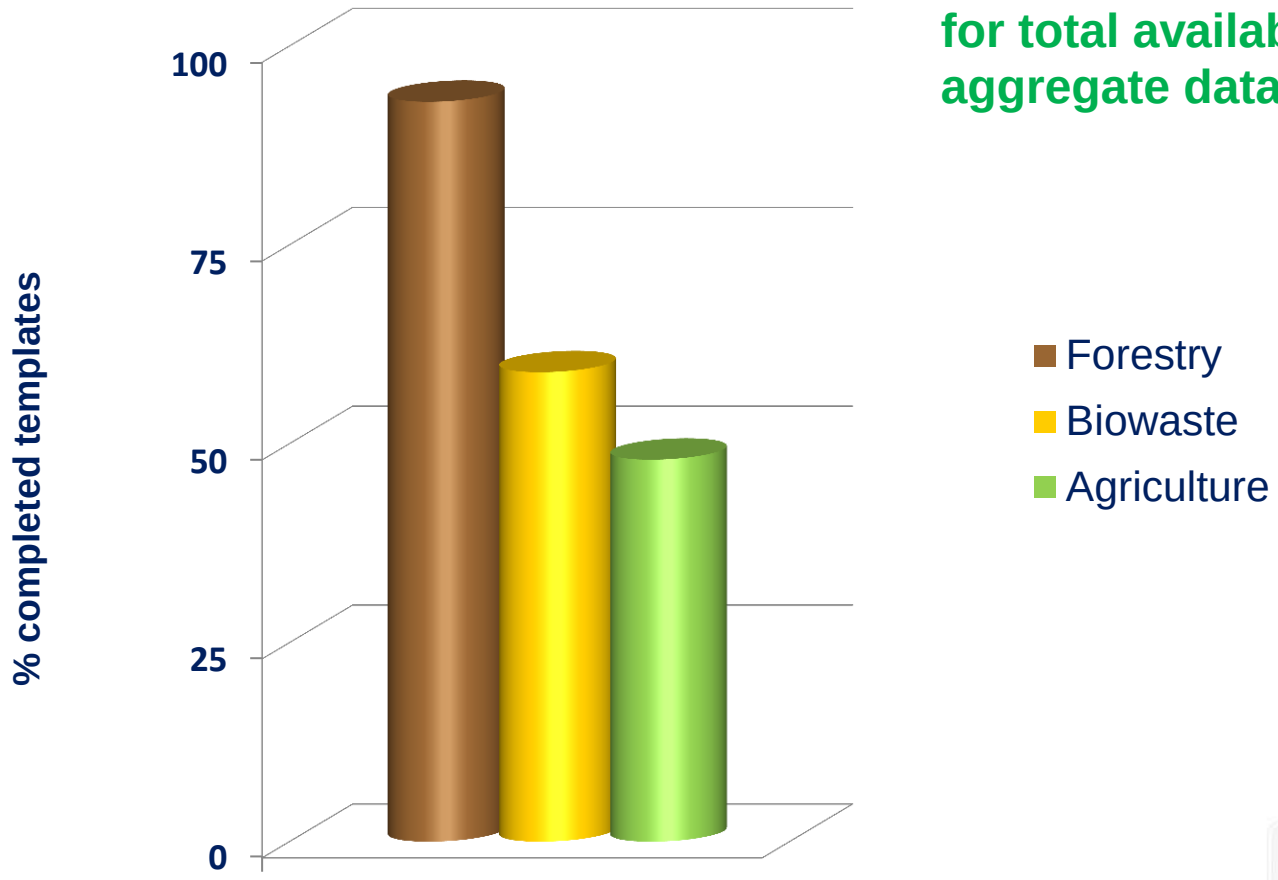
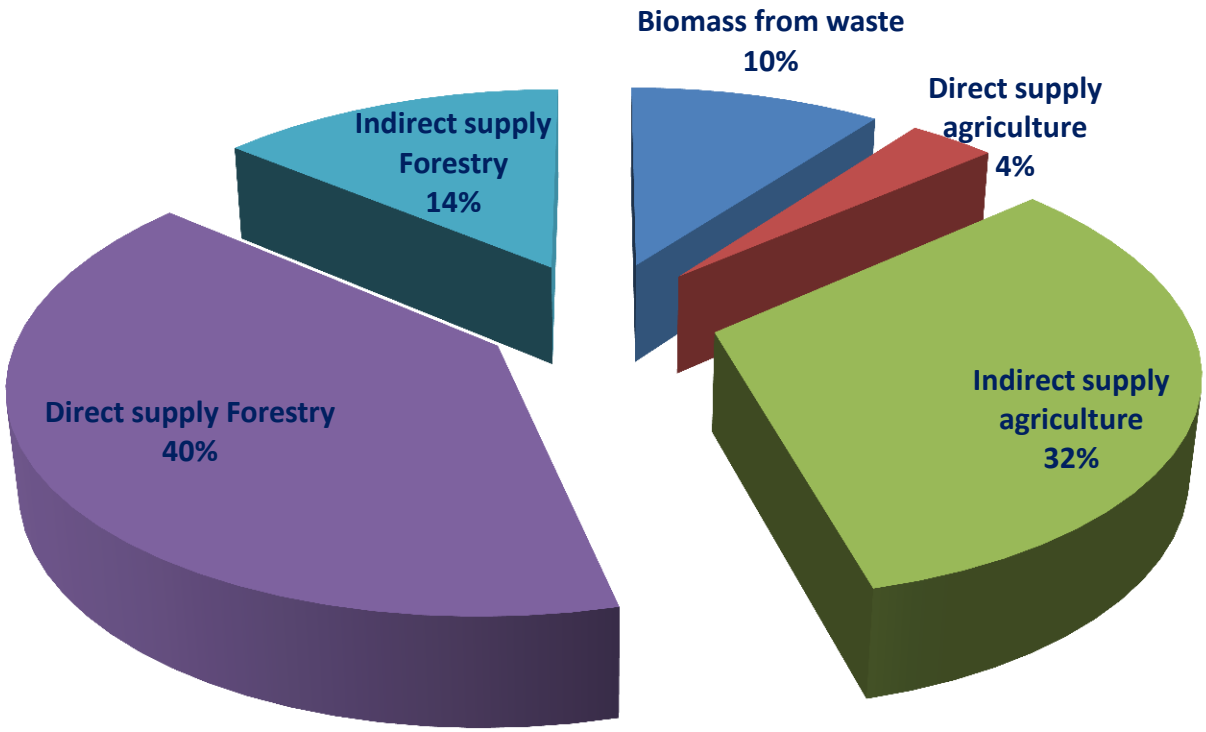


Figure: Percentage of EU countries with complete aggregate data in the three main biomass categories of the database

Biomass in EU27 (ktoe)

(reference years 2006-2010)



SAHYOG Inventory on Research Projects & Programs

Sources of Information - EU

- **Cordis**: All EU funded programmes with selection criteria for Biotechnology, etc
- Intelligence Energy Europe
- **Netwatch**: for ERANETs, and Becoteps for Technology platforms
- **Star Colibri**: for Biorefinery projects - www.star-colibri.net
- **Member States specific sites with information**

Sources of information - India

- **National Science & Technology Management Information System (NSTMIS) website** (This is the only central database available in the country but only very basic information is updated in this website);

- **Personally visiting the major funding agencies and research institutes** falling under the geographical area distributed among the Indian partners.

Criteria for considering the projects – India & EU

- Minimum funding: 1 million INR (€16.600,00 as per current conversion rate) in India and €500.000,00 in EU

- Time period: The projects for year 2007 onwards (completed and on-going)

SAHYOG Inventory on Research Programs and Projects

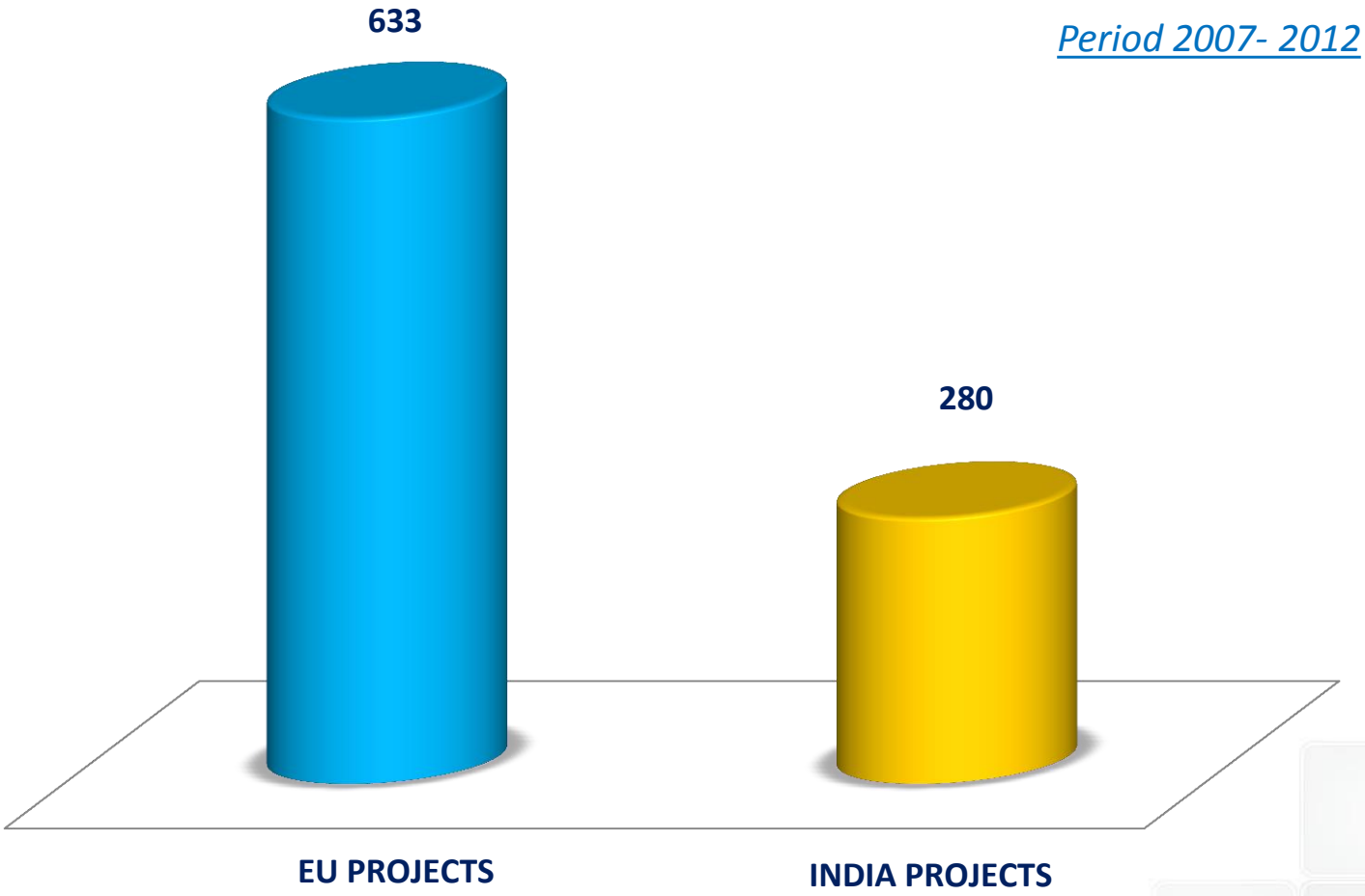
The inventory presents an overview of existing programs and research projects in Europe and India, with proper guidelines for its use and searchable with respect to the categories:

- Upstream/Downstream,
- Type of Biomass,
- Production and pre-treatment,
- Biomass conversion technology,
- Product,
- Type of research,
- Organisation type,
- Drivers, and
- Sectors.

Biobased projects identified in EU & India

Biobased Projects in EU & in India

Period 2007- 2012



Funding of Projects related to Biobased Economy

Period 2007 -2012

UE: >1,5 billion of Euro

India: 350 million Euro

SAHYOG Networking Events in 2013

SAHYOG SUMMER SCHOOL

OBJECTIVE: To stimulate research cooperation between Europe and India under SAHYOG project, with emphasis on recent developments on biomass and biowaste conversion

Organised by the Bioresource Technology Unit (BTU) of the National Technical University of Athens (NTUA)

Venue: the NTUA Zografou Campus

Period: From 9 – 16 June, 2013

Participants: A balanced group of well-selected Indian and European Young Researchers – *A Class of 20, with min. 10 Indian + max. 10 European ones*

Invited Speakers – more than 20

Scientific Topics:

1. Utilization of biomass and biowastes for bio-materials, bio-chemicals, and bioenergy production – Introduction and potential
2. Biomass characteristics: Physics, Chemistry, Biology, Engineering
3. Advances in the pretreatment of biomass for bioenergy production
4. Critical factors for fermentative conversion of biomass and biowastes to biofuels/biomolecules
5. Critical factors for thermochemical conversion
6. Bioethanol from lignocellulosic bio-feedstocks
7. Sustainable biodiesel production from biomass
8. Anaerobic digestion of for biogas production
9. Biological hydrogen production from biomass/waste
10. Innovative algae systems for biomolecules
11. Microbial fuel cells for bioenergy production
12. Other biomass and biowaste conversion pathways
13. Designing biorefineries for sustainable biomass use
14. Assessing feasibility & sustainability of biomass use

For more info: visit SAHYOG web-site

SAHYOG Twinning Event

Mini-Symposium and Project Twinning Event organized by WUR/DLO and NLAgency

Date: 4 – 8 November, 2013

Location: NLAgency offices, Utrecht, The Netherlands

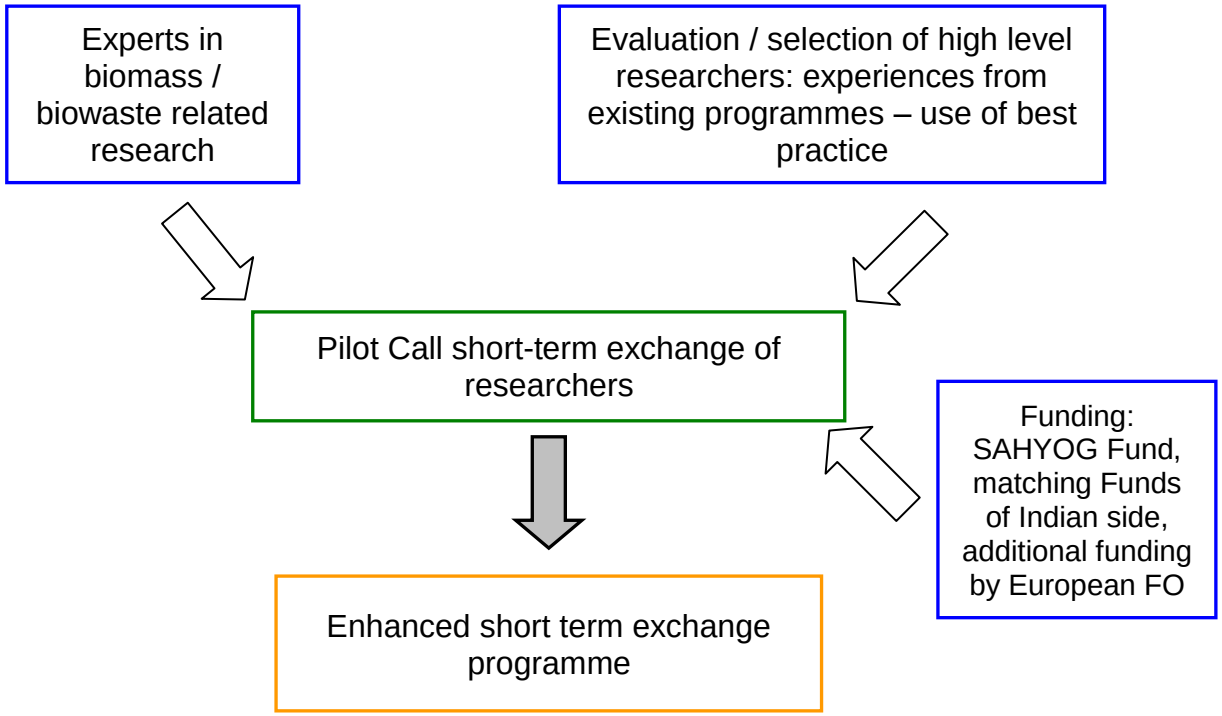
- An open **mini-symposium** is organized with relevant speakers from both the R&D field, industry, and government, within the general theme of EU-INDIA collaboration on biomass, biowaste and biotechnology.
- The symposium would then include a match-making event which would be focused on **project twinning** – future collab. in specific areas

✓ *Twinning of projects from India & Europe is supported by categorization of projects within the database*

✓ *Search facilities on the website will enable to identify projects for Twinning from India-EU working in the same research areas*

Short-Term Exchange Program

1. Programme design



- **The funding through SAHYOG is open to all EU & Indian researchers**
- **Tentative date for the Start of the Program: September, 2013**

EU – India Cooperation on Biomass and Bio-waste Research and Development

- an overview of current research and development initiatives in the field of biomass and bio- waste,
- the initial steps towards joint SAHYOG SRA,
- Discussion on the project activities with stakeholders.

The SAHYOG activities will be of great importance to bridge systematically the on-going respective activities from the two counterpart programmes for optimized efficacy and advancement of RTD with mutual benefit.

Thanks for your kind attention!

Italian National Agency for New Technologies, Energy and Sustainable Economic Development

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Acknowledgements to: all SAHYOG partners and the EU Commission & DST India for funding

For more information visit our web-site

http://www.sahyog-europa-india.eu/