Technology deployment and private sector experiences for development opportunities in the region

Budapest
24.06.2016
Your committed partner for commercialization

GROUP BIOTECHNOLOGY

**Munich R&D Center**
- Since 2006
- 118 employees
- Lab and office space: 6,500 m²
- Pilot plant since 2009
- Over 15 different feedstock tested on pilot-scale

**Straubing pre-commercial plant**
- Since 2011
- 22 employees
- Area: 2,500 m²
- Wheat straw, corn stover, barley straw, rapeseed straw, sugarcane straw & bagasse converted to Ethanol
The only validated integrated technology solution

THE SUNLIQUID® PRE-COMMERCIAL PLANT

2012
Start of operation at pre-commercial plant

up to 1,000
 t/a output of ethanol

~ 4,500
 t/a feedstock *
  * (cereal straw, corn stover, sugarcane bagasse & others)

~ 4
Years confirmation of commercial-scale design
Commercially Best in Class
FULLY INTEGRATED SUNLIQUID® PROCESS

Chemical-free pre-treatment

Simultaneous fermentation of C6 and C5 sugars

Feedstock

Pre-Treatment

Hydrolysis

Fermentation

Cellulosic Ethanol

Lignin

Integrated Enzyme Production

Feedstock and process specific enzymes

Vinasse
Your committed partner for commercialization
SUNLIQUID® – EN ROUTE TO COMMERCIALIZATION

**PRE-COMMERCIAL PLANT OPERATIONAL**
Capacity 1,000 t/a Ethanol
Validation on wheat straw

**2012**

**2013**

**2014**

**2015**

**2016**

**FEEDSTOCK VALIDATION**
Corn stover & sugarcane bagasse

**ISCC CERTIFICATION OF PLANT**

**E20 FUEL TESTING**
With Mercedes Benz & Haltermann

**PROCESS DESIGN PACKAGE**
For commercial-size plants

**PERFORMANCE RUNS**
With sugarcane residues (bagasse, tops & leaves)
With wheat & barley straw

**COOPERATION WITH WERNER & MERTZ**
sunliquid® ethanol in cleaning supplies

**GERMAN INNOVATION PRICE**
for Climate & Environment (IKU)

**PARTNERSHIP WITH SCANIA**
Ecotrucks use sunliquid 2G EtOH from bagasse in Brasil
sunliquid project experience: specific site selection criteria in EEU

1. **Feedstock availability**
   - National/regional crop production data
   - Regional feedstock breakdown

2. **Major feedstock suppliers**

3. **Complementary assets**
   - In prioritized regions, review access to
     - Existing CHP plant and energy setup
     - Logistics
     - Subsidies availability

- **Focus on 6 key countries** (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia)
- Each region **broken down to NUTS 1 granularity level**
- **Deliverables**
  - 20 regions screened for feedstock and major suppliers
  - Out of these, 16 regions prioritized and screened in detail
- **Currently evaluating 3 priority site locations**
Lesson learned, constrains and must have

- **Do your homework first**: technology validation is key!

- **Value chain security** (feedstock, CHP, by-product usage, offtake, financing/grant FP7&BBI)

- **Support** of the local community (farmers, Municipality, University, project champions, local players)

- **Technology showcase**: from theory to practice/reality, pre-commercial plant with local feedstock & lignin-sludge use

- **Advanced biofuel mandates** ramp up % mandate to 2020 and to 2030

- **National legislation** to allow bio-products valorization

- **State Aid Grant** support: NACE code blocks

- **Land ownership/catasto** often very difficult subject

- **Support to the feedstock value chain** (eg. Incentives to farmers to collect agricultural residues in the field and avoid in-field burning)
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For more information on sunliquid® technology visit www.sunliquid.com