

Beta Renewables 's PROESA™ TECHNOLOGY



BETARENEWABLES



Deployment in the Eastern Europe and Central Asia



**4th Bioenergy Week
Budapest,
21-24 June 2016**

Who we Are



BETARENEWABLES is a JV between Biochemtex, TPG (Texas Pacific Group) and Novozymes.

biochemtex is a the **Engineering company of the M&G Group** and BR's provider of key equipment

novozymes  is the world's leading supplier of **enzymes** to the biofuel industry
Rethink Tomorrow



is a world-class private **investment** firm with 48B\$ under management



What we do

BETARENEWABLES owns and licenses PROESA™ technology, used to produce advanced biofuels and chemicals, invests in continuous R&D for process improvement, provides performance guarantees and supports licensees on biomass supply chain and/or product offtake.

BETARENEWABLES owns and operates the 1st commercial-scale 2G ethanol plant in **Crescentino** (Italy) producing cellulosic ethanol since 2013.



Our experience with PROESA™ Technology



Energochemica - Strazske, SK

Feedstock:
Wheat straw and others

Ethanol Capacity:
55.000 MT/Y



Project kick off:
October 2014

BBI Flagship
21M € grant

Plant Start up, 2017



Perspectives of the activities in the regions



Eastern Europe

Local 1G producers, oil&gas groups and chemical companies are **closely looking to PROESA™ investment today**

Beta Renewables **completed several Feasibility Studies and commercial offers** for collocation of 2G beside 1G or retrofit of refineries and sugar factories

Studies for the Supply Chain have also been commissioned in the last 4 years to Beta Renewables to investigate the **best feedstock mix or crop cultivation** for a typical PROESA™ biorefinery

Typical Biorefinery size: **50.000 tons ethanol/year**

Typical Feedstock Mix: **Agricultural residues** (wheat straw, corn stover, rapeseed straw ect)



Perspectives of the activities in the regions



Central Asia

Increasing contacts/projects thanks to the huge biomass availability at competitive price

Historically devoted to agriculture, these regions count several **Agro Holding Groups capable to collect biomass** for future refinery and ready with their logistic fleet to export ethanol to the best offtake place

1G industry is still in development and **2G could also anticipate it**

Sugar industry is declining → 2G opportunity

Low production cost as driver



Opportunities and Challenges



*Many opportunities despite
few challenges*



Opportunities in the regions



Opportunities

Optimal **biomass availability and cost**

No strong competition for straw with other existing industries

Unused land for energy crops cultivation

Strategic **eligible areas for future export** to the European ports

Lower CAPEX & OPEX

Local key investors with **long term perspective strategies** on the future of biofuel

Availability of **structural funds at EU level** for project deployments



Challenges



Challenges

Collection of biomass is not yet a common practice in agriculture

Need to implement the typical equipment for collection and relevant investment

No political support from authorities for advanced biofuels deployment

No mandates for advanced biofuels in place

In Central Asia **1G industry has not yet taken off**, 2G industry could not benefit from existing know-how



*We thank you for your attention and
welcome your next visit in our plant in
Crescentino!*

