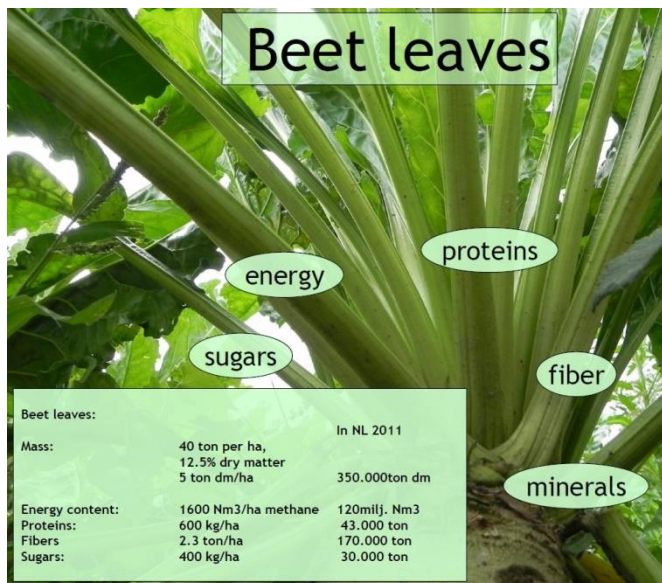




COSUN the unbeatable beet

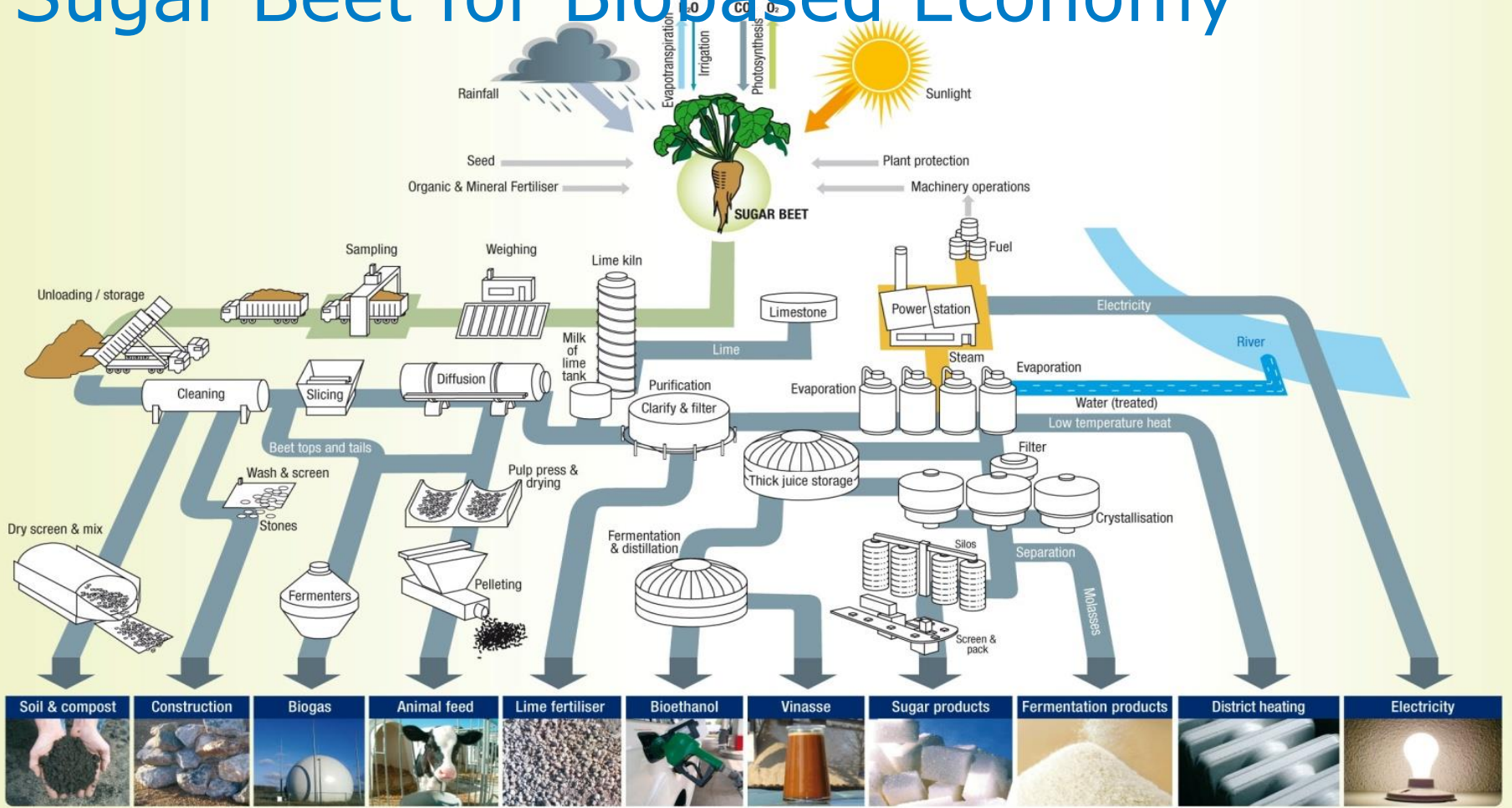
- Beet to food, feed, chemicals, materials and energy
- Cosun processes about 75,000 ha beet (22-25 tonnes d.m. per ha/year) into sugars and animal feed
- Within this pilot project they valorise the whole beet plant, i.e.: the beet, the leaves and the carrots



<http://www.cosun.com>



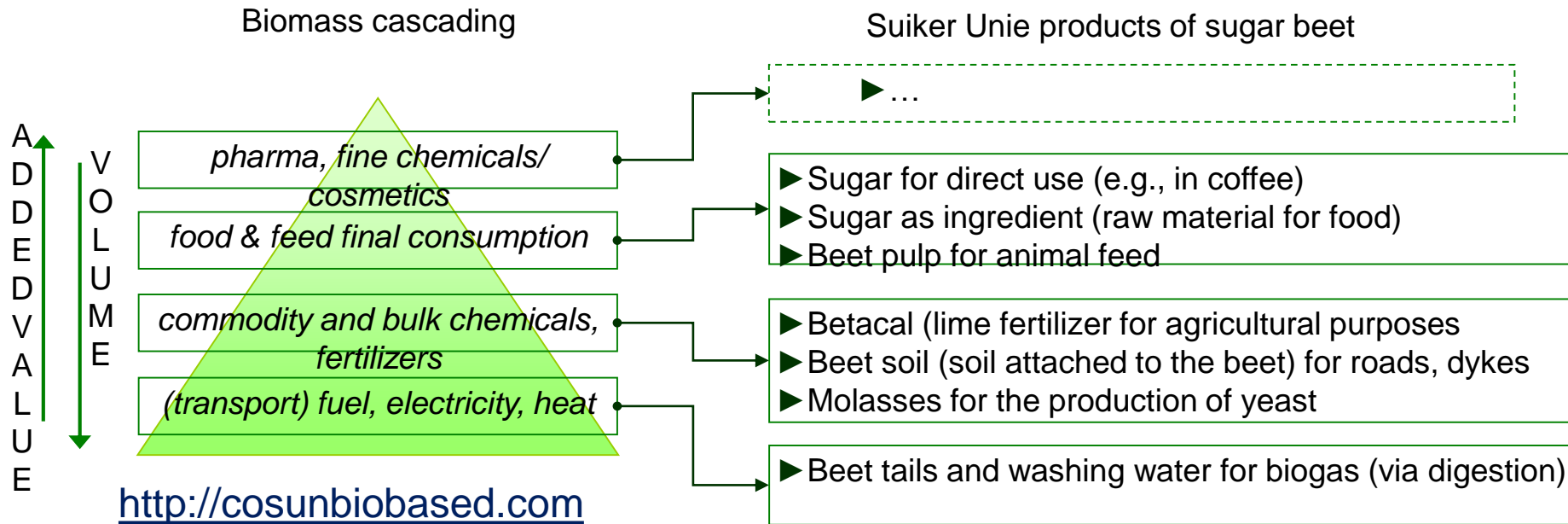
Sugar Beet for Biobased Economy



Source: CIBE and CEFS (after British Sugar)



Biomass Cascading and Valorisation



- Total concept, including a 50% increase in sugar beet yield per hectare, a 50% reduction in fertilizer use, and a 50% efficiency improvement in the sugar plant (all in about 20 years).
- Further optimization includes export of waste heat, and site utilization for renewable energy production (solar and wind).



Pyrolysis Empyro (www.btg-btl.com)

- **First Operational Plant in NL**

- Built in modules in Hengelo,
- operational since 2015

- **Phasing of applications**

- 1: burning ->
- 2: transportfuels ->
- 3: chemicals

- **Take off client:**

- 20 mln. liter/jaar, used by Friesland Campina Borculo for steam (supported by SDE+)





23 Dutch water authorities put wastewater to good use :

- **Increased Output:**
 - energy, biogas to power cars or electricity
 - raw materials ; phosphate, which is used to produce fertilizers.
- **Collaboration**
 - the water boards have set up a collaborative network organization called Energy & Raw Materials Factory (EFGF). <http://www.efgf.nl/english>
 - Joint Research programme with Universities



Products from waste water sludge

- Energy
- Fosphate
- Cellulose
- Bioplastics & Acids
- Alginate
- CO₂

- Movie:

- <https://www.youtube.com/watch?v=CT91VE6wfIc>

