



FUELCONTROL[®] Real-time solid fuel quality measurement system

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INRAY
Inray is a part of Protacon



- Inray develops real-time measuring and optimization systems based on X-ray technology for:
 - **Heat and power plants**, for improving the fuel quality control and the plant efficiency
 - **Sawmills**, for producing special products more profitably
 - **Pulp mills**, to measure wood chip quality
- Inray is part of Protacon Group



Protacon is a Finnish company established in 1990, is an industrial systems integrator, a technology partner in product development and a specialist in digital service business. Protacon employs more than 350 persons and the corporate turnover exceeds EUR 30 million.



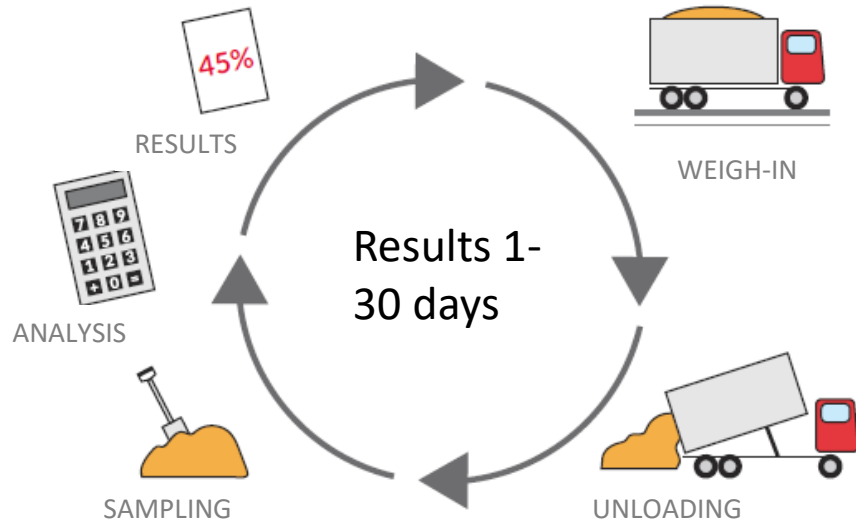
Solid biofuels are good energy source when quality stays reasonable. But...

- Challenges to measure moisture by sampling
- Foreign matter, unwanted but real problem



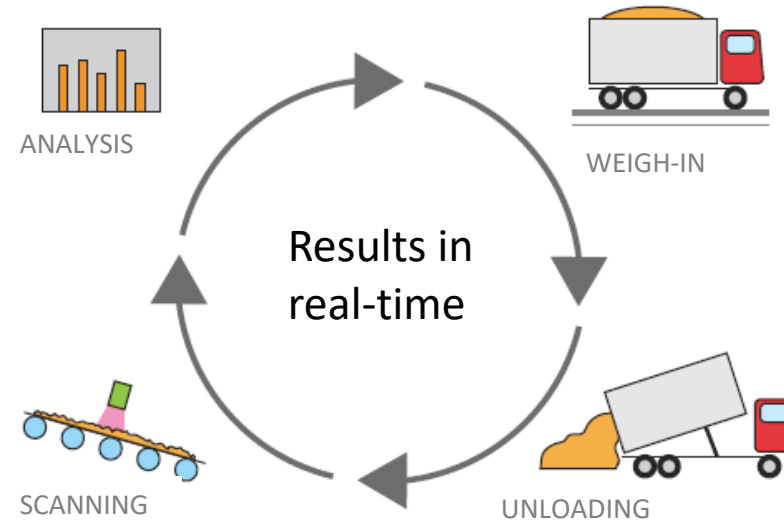
Comparison to current practice for fuel quality control

Current practice



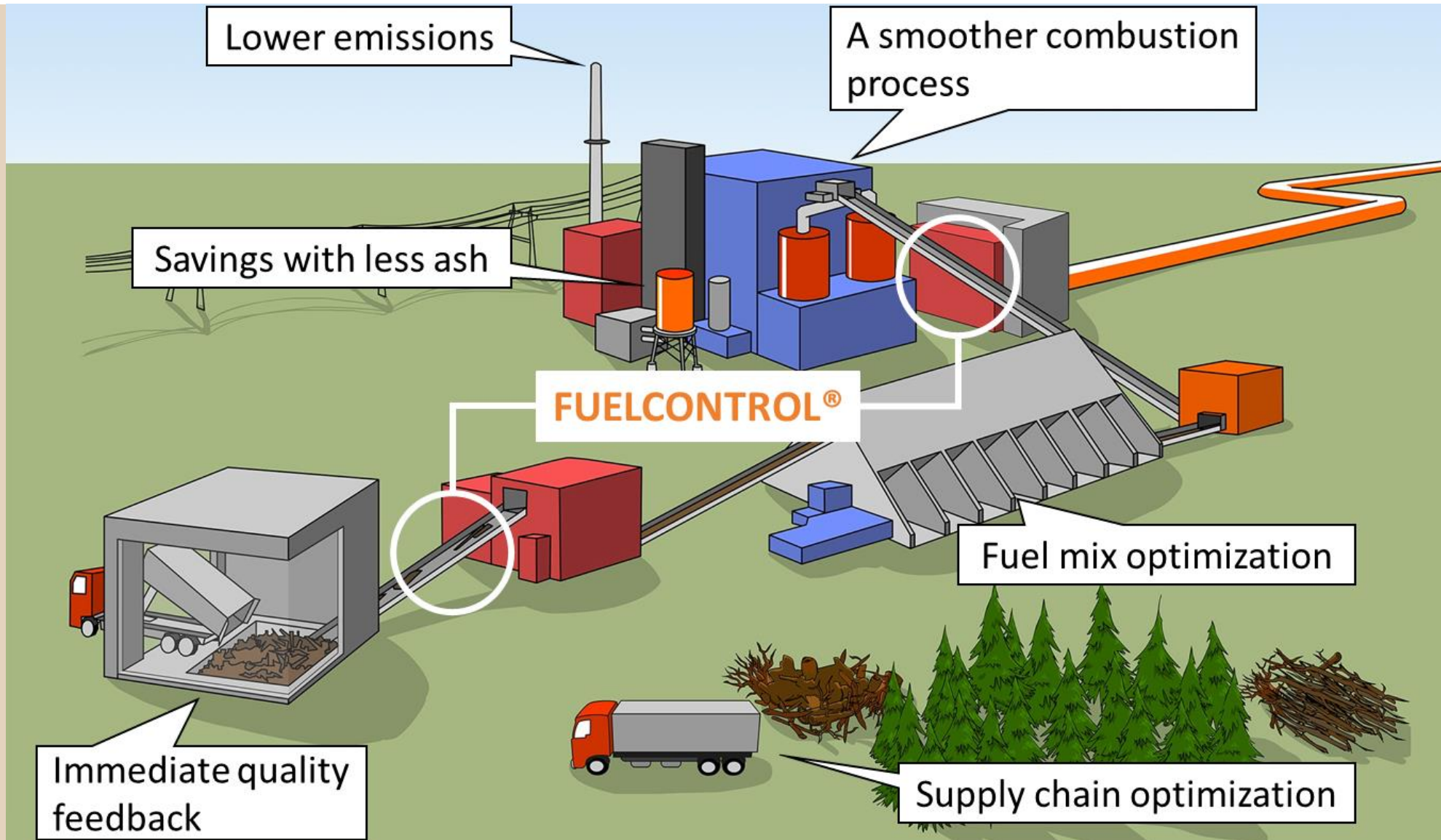
- Results from composite samples:
 - Moisture content one result/several trucks
 - Heating value one result/month
- Truck-load based quality feedback is difficult

FUELCONTROL[®] -method



- Moisture and foreign matter results in real-time
- Truck-load based results
- Total measurement, everything will be scanned
- Immediate quality feedback to fuel suppliers

Why analyse fuel quality in real-time?



References 50-400 MWth biopower plants

Example Biopower plant:
Fuel consumption 500 GWh
Fuel costs 10 M€/year
Savings 40 000 €/month

- UPM Kymmene Plc 2015/2016, 2 systems
- Fortum Plc 2016
- UPM Kymmene Plc 2017
- Etelä-Savon Energia 2018
- Tornion Voima 2018
- TSE 2019, 3 systems
- Vantaan Energia 2019
- Fortum Plc 2020

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