SUSTAINABLE BIOMASS ENERGY GENERATION

CAPABILITY STATEMENT

WWW.RAMBOLL.COM/ENERGY
CONSULTANCY SERVICES WITHIN BIOMASS

With Ramboll’s experience from design of dedicated biomass fuelled plants, co-firing and 100% biomass conversion, we can ensure cost-effective, client-focused sustainable and durable solutions with significant CO₂ footprint reductions and still maintain up to 100% power generation capability.

Sustainable biomass offers a renewable low carbon alternative to fossil fuels for thermal power and heat generation. It is also a means to ensure dispatchable and reliable power production.

Ramboll has implemented biomass plants of all types and is a global leader in this area.

New build and coal-to-biomass conversions

In addition to developing multiple new biomass power and CHP plants, Ramboll staff pioneered the conversion of coal plants to biomass firing – at a time when there was no experience in the contracting supply chain.

Ramboll has designed and implemented:
- Dedicated biomass fuelled plants in sizes from 17MMBTU (5MW) to over 100MW, based on fuels like straw, wood chips, forest residues and waste wood types.
- Co-firing and 100% biomass conversion with different boiler configurations up to 3,000MMBTU.

SELECTED PROJECT REFERENCES

- **Lynemouth Units 1-3, UK** - 420 MW. Full biomass conversion, including an import terminal, site fuel handling and storage. Owner’s Engineer.
- **Asnæs Unit 6, Denmark** - 180 MW. New build dedicated biomass fired power plant integrated into the existing power plant site. Owner’s Engineer
- **HOFOR BIO4, Denmark** - Owners engineer for the construction of the 150MW power and 400MJ/s heat big wood pellet fuelled CFB CHP plant.
- **Sandvik Unit 3, Växjö, Sweden** - 40 MW. New biomass fired unit. Owner’s Engineer
- **Studstrup Unit 3, Denmark** - 365 MW. Full biomass conversion, supplying electricity and heat to the surrounding district heating system. Owner’s Engineer
- **Avedore Unit 2, Denmark** - 575 MW. 100% biomass conversion of one of the world’s most efficient multi-fuel power plants. Owner’s Engineer
- **Avedore Unit 1, Denmark** - 265 MW. Full biomass conversion. Owner’s Engineer.
- **Immingham, UK** - Wood pellet import terminal with 200,000 tonnes of storage capacity. Expert Adviser.
- **Gladstone Dock, Liverpool, UK** - Wood pellet import terminal with 100,000 tonnes of storage capacity. Expert Adviser.
SUPPORT AND CONSULTANCY SERVICES
Ramboll offers all engineering services with respect to planning, design, tendering, construction and operational phases for biomass conversion of existing coal fired power plants and for dedicated new build of CHP plants, fuelled by all types of biomass. Our services include:

From planning to operation
Ramboll offers all services across all professional disciplines with respect to the planning, design, tendering, construction and operational phases for new build or re-design of existing plants.

Of particular importance for coal-to-biomass projects, Ramboll provides assessments based on specific coal-to-biomass process and CFD model tools, calibrated against realised projects, specialists in process safety and risk management as well as specialists in mitigating inherent fire & explosion and HSE risks associated with biomass plant design and operation.

Innovative solutions
Ramboll has designed:
• Highly automated bio fuelled power plants that only require manpower during day time on week days,
• Integration of biomass boilers with existing PC steam generator systems,
• Transformation of PC boilers into grate firing,
• Biomass fired Ultra-Super-Critical steam generator plants.
• 3D CFD model for conveyor transfer points developed to maximise flow and minimise dust creation and propagation.

Ramboll is delivering also biomass market surveys, biomass sourcing strategies as well as facilitating biomass procurement processes for clients.

WHY CHOOSE RAMBOLL FOR YOUR PROJECT?
Our 240 staff strong Power Division is the market leading designer of coal-to-biomass conversion of existing PF Power plants and high efficiency biomass fuelled CHPs.

No-learning-curve client support at every step of the project.

Unmatched internationally respected experience.

In-depth knowledge of technologies, suppliers and plant operation.

Our biomass conversion design features can allow 100% MCR to be maintained.

Multiple realised references.

Expertise at detailed process level across the entire plant.
CONTACT

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