
SYNOVA
SMM6 Presentation - November 2019
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Overview

- M6 is a containerized waste or biomass to energy conversion system that can be shipped directly to any location.
- Developed by the Energy Center of the Netherlands (ECN), the proprietary MILENA gasifier and OLGA gas cleaning systems are adaptations of service-proven units from the refinery industry.
- Synova's proprietary gasification and gas cleaning technology turns solid waste or biomass into a stable renewable alternative to natural gas, suitable to produce sustainable and clean electricity, fuels or chemicals.
- The technology offers significant advantages over conventional alternatives to landfill including incineration, pyrolysis or other gasification technologies.
- Small size, high efficiency, lower capital and operating costs, non-hazardous by-products, economical for use by governments, corporates, islands, and hybrid renewables.
- M6 is suitable for markets where power prices are high (diesel displacement) or chronic waste management issues pervade.
- M6 comprises of pre-assembled, factory tested modules, which minimize field work and construction. Designed by Synova, fabricated by a blue chip modularization specialist in Asia and shipped globally.

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Proprietary WTE Technology

1

Pre-treatment

Waste

Remove water, glass, stones, metal, other recyclables

2

Gasification

Feedstock

Fluidized bed, 90%+ diversion from landfill

3

Gas cleaning

Raw Gas

Clean Gas

Tar and other contaminant removal, zero waste water

4

End Use

Power

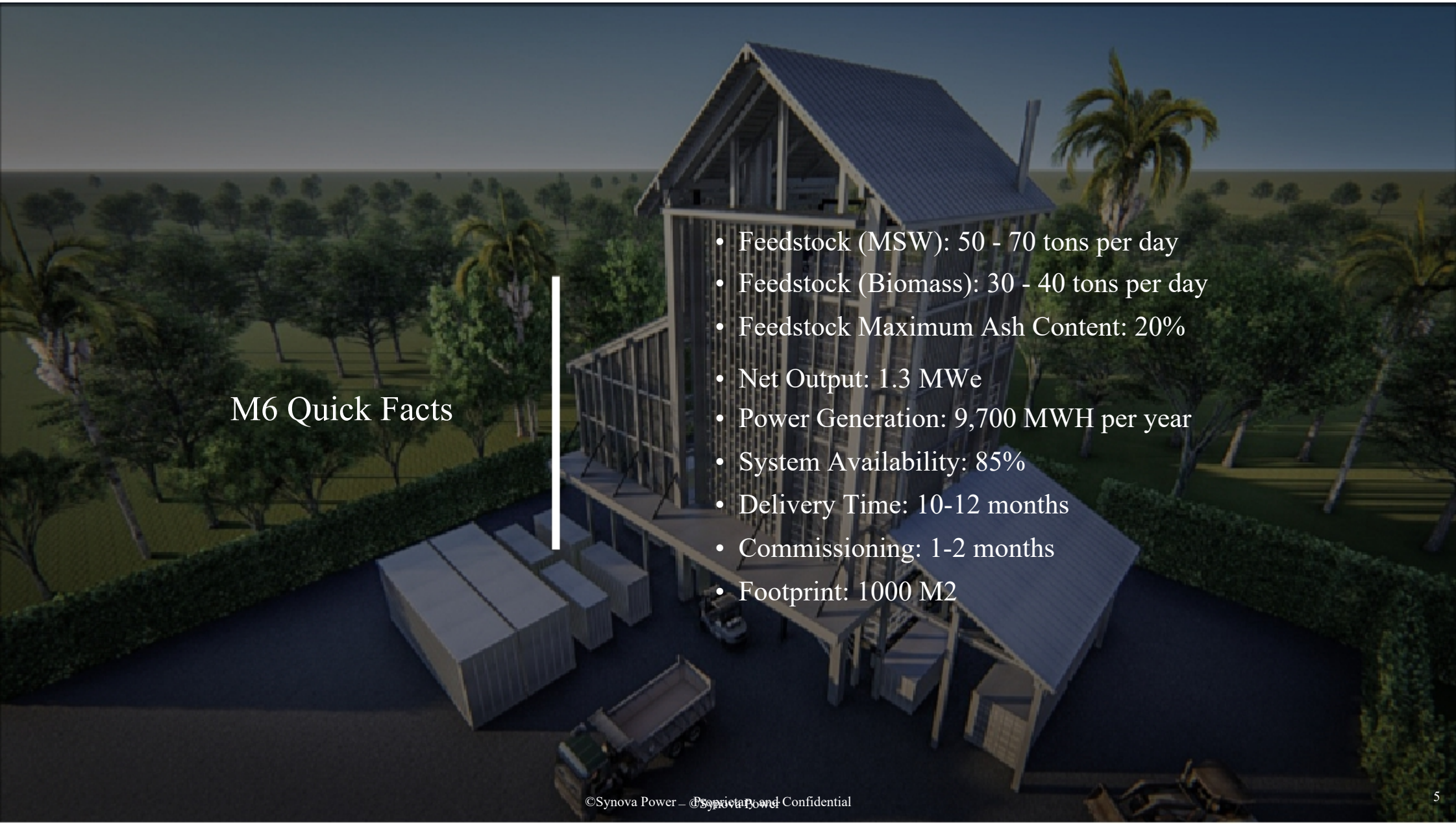
Highly efficient power via gas turbine or engines

Differentiated by 2 & 3 patented proprietary technology

Milena and Olga

Proprietary **MILENA®** Gasifier
Indirect gasifier means no dilution by nitrogen or CO_2, & no oxygen plant required
Fluidized bed, proven with wide range of feedstocks
Single vessel and bed (other indirect gasifiers as many as four vessels, more cost)
Highly efficient, for heat comes from what others waste: chars and tars
Limited fuel preparation required; Heterogeneous feedstock acceptable

Proprietary **OLGA®** Gas Cleaning
Robust technology for the removal of tars (incl. dioxins)
Over 99.9% of tars removed; dew point reduced from over 400ºC to less than 15ºC
Low parasitic, pressure friendly, works at large scale
Removal of tars allows standard equipment to effectively remove other contaminants
Solves tar problem, that has been waste gasification key problem, higher value



M6 Quick Facts

- Feedstock (MSW): 50 - 70 tons per day
- Feedstock (Biomass): 30 - 40 tons per day
- Feedstock Maximum Ash Content: 20%
- Net Output: 1.3 MWe
- Power Generation: 9,700 MWH per year
- System Availability: 85%
- Delivery Time: 10-12 months
- Commissioning: 1-2 months
- Footprint: 1000 M2

Reference Plants

40 kW Milena-Olga to Gas Engine & Chemicals

Location: ECN Lab Facility, Petten, Netherlands
Operations: 2004 – to date (4500+ hours of operations)
Feedstock: Wide range of waste and biomass
Status: First proof of Milena-Olga applications

4.0 MW Fixed Bed Gasifier-Olga to Gas Engine

Location: Cat Engine Distributor, Moissannes, France
Operations: 2004 – 2007 (Demo only)
Feedstock: Wood chips and pomace (grape residue)
Status: Successful campaign; removal of RE subsidies

0.8 MW Milena-Olga to Gas Engine & Turbine

Location: ECN Lab Facility, Petten, Netherlands
Operations: 2008– to date (Demo only)
Feedstock: Wide range of waste and biomass
Status: Demonstrated predictable scale-up of Milena-Olga; RDF

4.0 MW CFB Gasifier-Olga to Gas Engine

Location: Chicken Producer Facility, Tondela, Portugal
Operations: 2011 – 2015 (removal RE subsidies shut down 2012-13)
Feedstock: Chicken litter, wood chip and RDF
Status: Successful RDF Campaign; plant sold for conversion to RNG

4.5 MW Milena-Olga to Gas Engine

Location: Soy Producer Facility, Washim, India
Operations: 2017 – to date (seasonal due to operators business)
Feedstock: Soy stalks
Status: Commissioned by Thermax; Off-grid application

6.0 MW Milena-Olga to Gas Engine

Location: Suranaree University, Nakhon Ratchasima, Thailand
Operations: 2019 (seasonal due to operators business)
Feedstock: RDF (produced by host)
Status: ContaineriZed design; Fabricated in Thailand

M6 Specifications

Item	Amount
Feedstock	~30-35tonsperdayRDForBiomass(~50-70tonsperdayMSW)
MoistureContent	25%moisture(Maximum35%)
FeedstockSize	Maximum80mmon3dimensions
EnergyContent	16.8MJ/kg
NetCapacity	1.3MWe
NetOutput	9,680MWh/yr
ParasiticLoad	1,860MWh/yr
WaterConsumption	^{3} 1,550M/yr
WaterDischarged	^{3} 2,480M/yr
BottomAsh	360MT/yr(assumes10%ash)
FlyAsh	800MT/yr(assumes10%ash)
CausticSoda	50MT/yr
SodiumHydroxide(33%)	250MT/yr
SulphuricAcid(96%):	200MT/yr
SandBedMaterial	200MT/yr

- An SMM 6 Gasification plant delivered to site in 40 x 40’ shipping containers ready for erection.
- To provide additional information regarding the civil and installation costs we would need to perform our pre-engineered du-diligence study.
- As with all project large or small the devil is in the detail and details = de-risked capital investment and on time on budget projects.

EWS are pleased to provide this brief power point presentation and we hope that going forward we can partner with you in this exciting opportunity.

Should you have any questions please contact Gary Ridout, CEO of Enviro Waste Systems Pty Ltd. On 0419347198.

Thank you for your interest