SSRH Relevance to Agriculture

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Agriculture and Food Development Authority

Progress towards targets

	End of 2017	End of 2018	Target 2020
Overall Renewable Energy	10.5%	11%	16%
Renewable Transport	7.4%	7.2%	10%
Renewable Heat	6.7%	6.5%	12%
Renewable Electricity	30.1%	33.2%	40%

Renewable heat energy by source, 2005 to 2017

	Quantity (ktoe)			Shares (%)		
	2005	2010	2017	2005	2010	2017
Biomass	176	187	247	94%	86%	79%
Biogas	7	8	10	4%	4%	3%
Solar thermal	0	7	14	0%	3%	5%
Ambient	4	16	41	2%	7%	13%
Total renewable heat	**187**	**218**	**312**	**100%**	**100%**	**100%**
RES-H (%)	**3.4%**	**4.3%**	**6.9%**	-	-	-

Ireland was 27th out of the EU-28 for renewable heat in 2016 – 6.8%

Sustainable Support for Renewable Heat (SSRH)

- The Irish Government expects the SSRH to make a significant contribution towards their 2020 ambition of having 12 per cent of heating coming from renewable sources.

Phase one of the SSRH:

- Phase 1: the introduction of the SSRH for non-domestic installations in the industrial, business and public sectors.

Plan Projects Carefully

- Ascertain what type of fuel suits you best.
- Solid fuel (manual handling), pellets or chip (automated)
- Fuel supply, storage and delivery
- Eligibility of boiler, installer and final use of heat
- Boiler sizing
- Biomass must be the primary fuel source
- Installers will be very busy – unforeseen setbacks
- Look at track record of supplier, manufacturer and installer

Eligible Use of Heat

- Inefficient drying practices in order to maximise payments.
- Grain drying (allowed)
- Wood-fuel drying (Not allowed)
- Swimming Pools – (Municipal or Commercial)

SSRH is designed to off-set use of fossil fuels

Process of drying is major consumer of fossil fuels in our maritime climate.

Fuel Requirement

- Rule of Thumb – Biomass boilers require about 1t of dried woodchip a year (30% moisture) for every kilowatt installed.
- Logistics is key – transport is expensive
- Woodchip has a range of moisture contents
- Quality Assurance

Wood chip versus pellet

- Wood pellet is four time denser than chip
- Woodchip is cheaper
- One tonne of woodchip generates 3,500 kWh (@30% moisture) occupies 6m^3
- One tonne of wood pellet generates 4,800 kWh (@8% moisture) occupies 1.5m^3
- Farmers generally well able to manage bulkier biomass

Value of Straw Compared to Oil

Bale Type	Bale Weight	Kilo watt hours (kWh) per bale	Oil equivalent (litres)	Oil Value equivalent (€0.60 c/L)
4 x 4 Round	150kg	690	66	€40
5 x 4 Round	250kg	1,150	110	€66
8 x 4 x 4 Square	500kg	2,300	220	€132

Fuel Storage Requirements

Boiler Output	80 kW	350 kW	1,000 kW	2,000 kW
Fuel input	25 kg/hr (100 kW)	100 kg/hr (400 kW)	300 kg/hr (1,200 kW)	600 kg/hr (2,400 kW)
1 m3 / 150 kg storage	6 hrs	1.5 hrs	Too small	Too small
4 m3 / 600 kg storage	24 hrs	Too small	Too small	Too small
16 m3 / 2,400 kg	4 days	24 hrs	8 hrs	Too small
48 m3 / 7200 kg	12 days	3 days	24 hrs	12 hours
55 m3 / 8250 kg	14 days	3.4 days	28 hrs	14 hours
500 m3 / 75,000 kg	Too big	31 days	10 days	5 days

SSRH proposed tariff levels (Cent for each kWh of heat produced)

Tier	Lower Limit (MWh/yr)	Upper Limit (MWh yr)	Biomass Heating Systems Tariff (c/kWh yr)	Max Payment
1	0	300	5.66	€16,980
2	300	1,000	3.02	€21,140
3	1,000	2,400	0.5	€7,000
4	2,400	10,000	0.5	€38,000
5	10,000	50,000	0.37	€148,000
Total				€231,120

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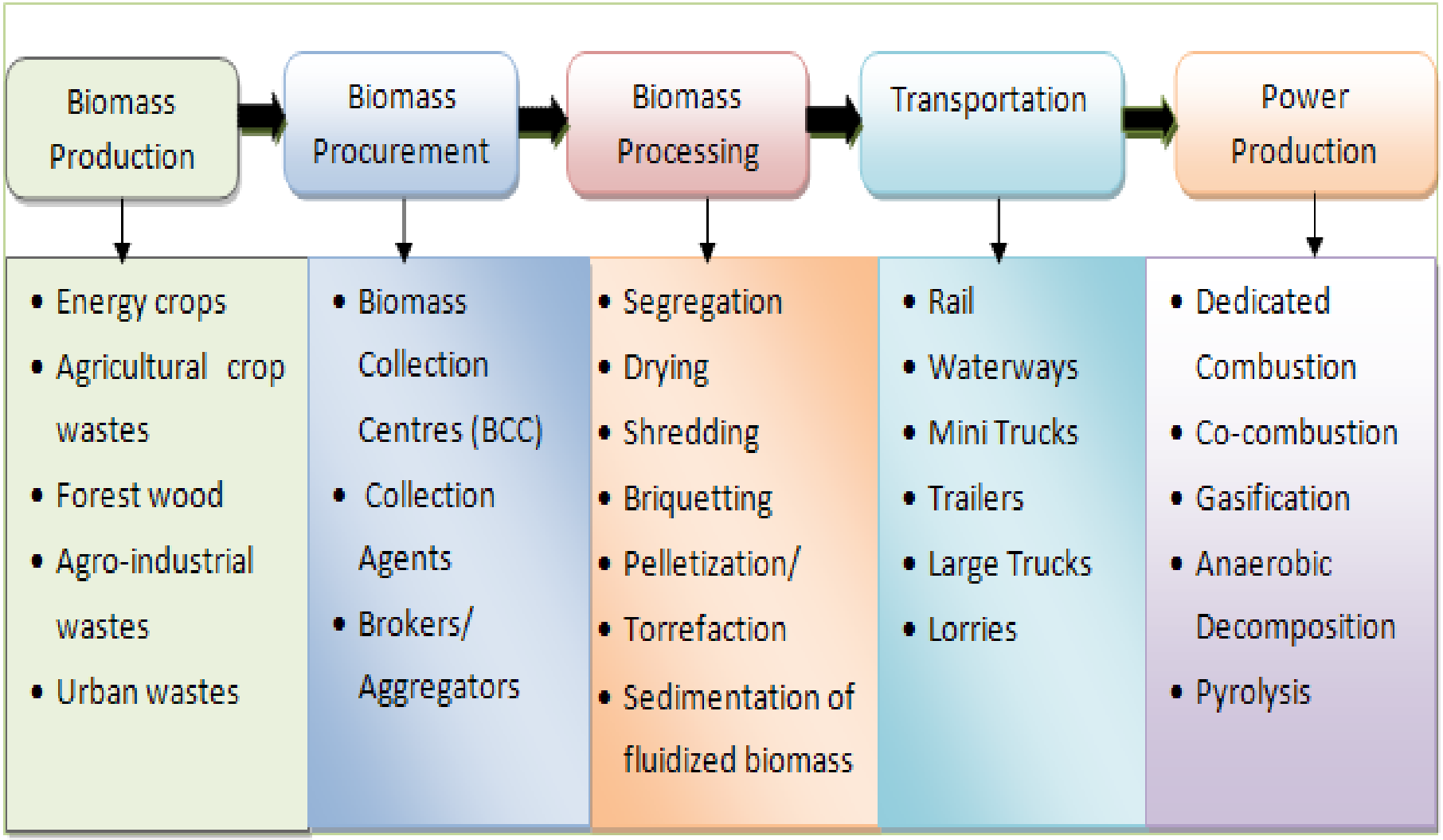
Market Opportunities

- Does not contain banded sweet spots like UK – 199kW or 999kW
- Leisure centres, hotels, hospitals, nursing homes where 1,000 MWh of heat are covered by the two first tariffs.
- Running installations of around 300kW to 400kW at 3000 full load hours – securing €38,000

Agricultural Supply Chains

- Opportunity for farmers to sell renewable heat.
- Biomass Trade Centres – Solid link between grower and consumer of biomass.
- Agricultural feedstocks: Pulpwood, Straw, Purpose Grown Energy Crops, Grass Silage for Biogas - Anaerobic Digestion

Pre-processing of Biomass



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Comparing fuel costs

- 1,000 litres of oil contains 36.68 GJ of energy or 10,190 kWh of energy.

Oil at €0.76 litre = €760 / 10,190 kWh = **7.4 cent per kWh**

- Wood chip at €120 per tonne @ 30% moisture content 3,400 kWh per tonne = **3.5 cent per kWh**

Drying Grain

- Drying from possibly 26 % MC to 15% MC for safe storage.
- High temperature dryers
- 5 – 10 litres of oil per wet tonne (50 – 100 kWh) of oil when removing 5% moisture

Pig Farms

- Heat needed in farrowing and weaning unit
- Energy is expressed in kWh per pig produced.
- Farrowing room 24ºC - 20ºC (15 kWh per pig produced)
- Weaner room 6kg – 17kg live weight 3 kWh/pig (first stage weaners)
- One sow produces approx. 27 pigs per year.

Poultry Units

- Typical bird house size 25 – 27,000 birds.
- 6.5 week turnaround and 7 to 7.5 batch cycles
- Benchmark 1.27 kWh per bird produced
- 1.27 x 25,000 birds x 7.5 cycles per shed = 238 MWH

Mushroom Units

- Energy consumption expressed in kWh per kg of mushrooms produced.
- 41 mushroom production units
- Teagasc estimate heat requirement on mushrooms 0.85 kWh / kg

CO2 Emission Factor

Energy Source	CO2 emission kg/kWh
Grid electricity	0.437
Natural Gas combustion - Heating	0.205
Coal - combustion	0.340
Kerosene	0.257

If I use 4,000 kWh of electricity in the year I'm producing
4,000 x 0.437kg = 1,748kg or 1.75tonnes of CO2

Kerosene Oil has 10.5 kWh per litre. 1,000 litres = 10,500 kWh
10,500 x 0.257 = 2,698 kg or 2.7 tonnes of CO2

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Take Home Message

GET TO KNOW THE FUEL YOU'RE GOING TO USE

- Understand the fuel you're going to use, it's pros and cons, key design considerations, availability - and stick to it.

DESIGN YOUR FUEL STORAGE AND RECEPTION AROUND YOUR FUEL CHOICE

- Think about lifecycle costs, practicalities of fuel delivery and storage.

USE PROVEN TECHNOLOGIES

- Don't try to reinvent the wheel.

Thanks for your attention

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