

Biogas Update of the Global Methane Initiative (GMI) Turkey

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Turkey - Biogas Update

- New trends in the biogas sector
 - *Increase in production*
 - *Increasing trend for landfill gas to energy facilities, sludge & MSW & farm digesters*
 - *~ 22 landfill gas to energy plant*
 - *~ 20-25 farm&agricultural waste digesters*
 - *~ 20 sludge digesters*
 - *~ 5-10 food waste industry digesters*
 - *~ 4 MSW digesters*
 - *~ 50-60 wastewater digesters*

- New trends in the energy sector
 - *Increase in production and consumption*
 - *Increasing trend for wind*

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- Regulatory updates
 - *Feed in tariff since 2010.*

Type of Renewable Energy Source	Price (US dollar cents/kWh)
Hydroelectricity	7.3
Wind	7.3
Geothermal	10.5
Biomass	13.3
Solar	13.3

- *Biodegradable municipal waste (BMW) acceptance to landfills in 2015, 2018 and 2025 must be reduced to 75%, 50% and 35% of total BMW generation in 2005, respectively.*

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■ Specific project updates

Landfill gas to energy plants in Turkey

Start Year of Operation	Plant Name	City	Installed Capacity (MW _e)
2007	Odayeri Landfill Gas to Energy Plant	İstanbul	33.8
2006	Mamak Landfill Gas to Energy Plant ¹	Ankara	25.4
2008	Sincan-Çadırtepe Landfill Gas to Energy Plant ¹	Ankara	22.6
2007	Kömürcüoda Landfill Gas to Energy Plant	İstanbul	16.9
2010	Adana Landfill Gas to Energy Plant ¹	Adana	15.5
2011	Bursa Landfill Gas to Energy Plant	Bursa	9.8
2011	Her Enerji Kayseri Landfill Gas to Energy Plant	Kayseri	5.8
2011	Aslım Enerji Landfill Gas to Energy Plant	Konya	5.7
2009	Gaziantep Landfill Gas to Energy Plant	Gaziantep	5.6
2011	Kocaeli Landfill Gas to Energy Plant	Kocaeli	5.1
2013	Arel Enerji Manavgat Landfill Gas to Energy Plant	Antalya	3.6
2015	Trabzon-Rize Landfill Gas to Energy Plant	Trabzon	2.8
2015	Sivas Landfill Gas to Energy Plant	Sivas	2.8
2014	Amasya Landfill Gas to Energy Plant	Amasya	2.4
2014	Afyon Landfill Gas to Energy Plant	Afyon	2.4
2014	Aksaray Landfill Gas to Energy Plant	Aksaray	1.4
2010	Bolu Landfill Gas to Energy Plant	Bolu	1.1
2015	Dilovası Landfill Gas to Energy Plant	Kocaeli	1.1
2012	Kırıkkale Landfill Gas to Energy Plant	Kırıkkale	1.0
2008	Karatepe Landfill Gas to Energy Plant	Tekirdağ	0.8
2010	Kumkısık Landfill Gas to Energy Plant	Denizli	0.6
2004	Hasdal Landfill Gas to Energy Plant	İstanbul	0.6
Total			167

¹ It also includes biomethanization facility

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- Specific project updates



*Landfill gas to energy plants in Turkey
(Numbers show the installed capacity)*

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- Specific project updates



Istanbul Odayeri landfill gas to energy plant, 33.8 MW

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Istanbul Komurcuoda landfill gas to energy plant, 16.9 MW

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Bursa landfill gas to energy plant, 9.8 MW

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Konya landfill gas to energy plant, 5.7 MW

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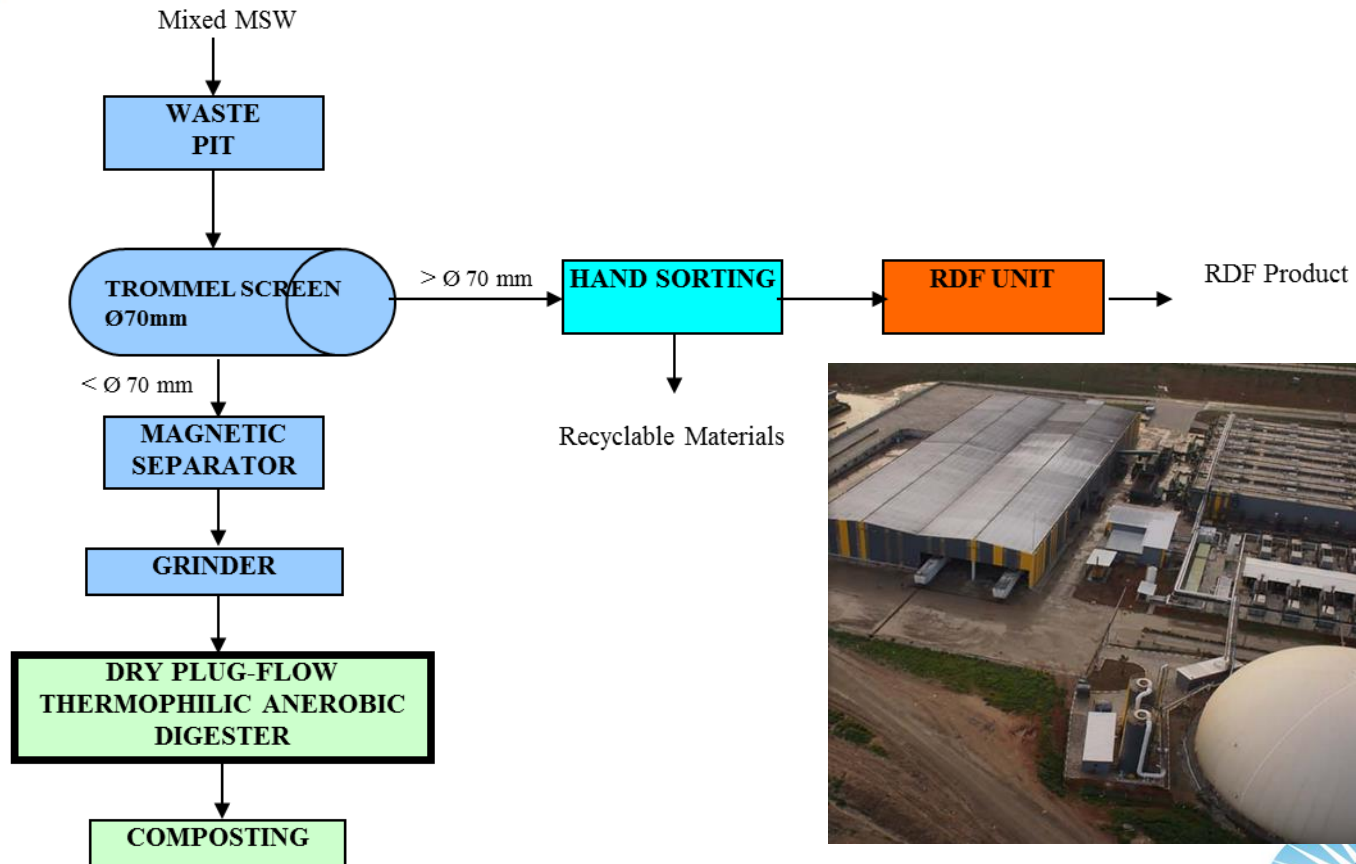
- Specific project updates



Gaziantep landfill gas to energy plant, 5.6 MW

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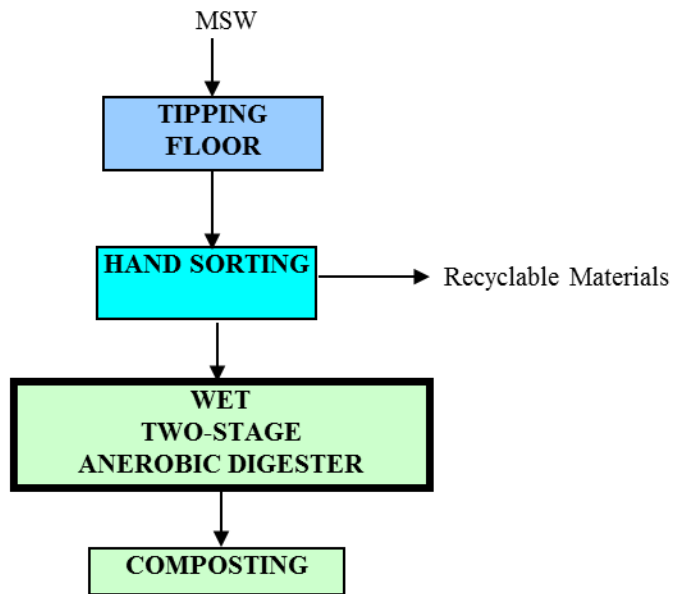
- Specific project updates



Ankara MSW Digester

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Sakarya MSW Digester



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Istanbul-Ataköy Sludge Digesters

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İstanbul-Ambarlı Sludge Digesters

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Istanbul-Tuzla Sludge Digesters

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Ankara Sludge Digesters

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Adana Sludge Digesters

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Kayseri Sludge Digester

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- Specific project updates



Sutas Aksaray Farm Digester

Biogas Project Outlook

- Implementation of national plans/directives
 - *Waste Management Action Plan*
 - *National Climate Change Strategy Document*
- Challenges to emission reduction projects in Turkey:
 - *Finance*
 - *Problems with bureaucracy*

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