



Biogas Upgrading

Advances in Grid Injection

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Advances in Grid Injection



Wiener Stadtwerke Holding AG



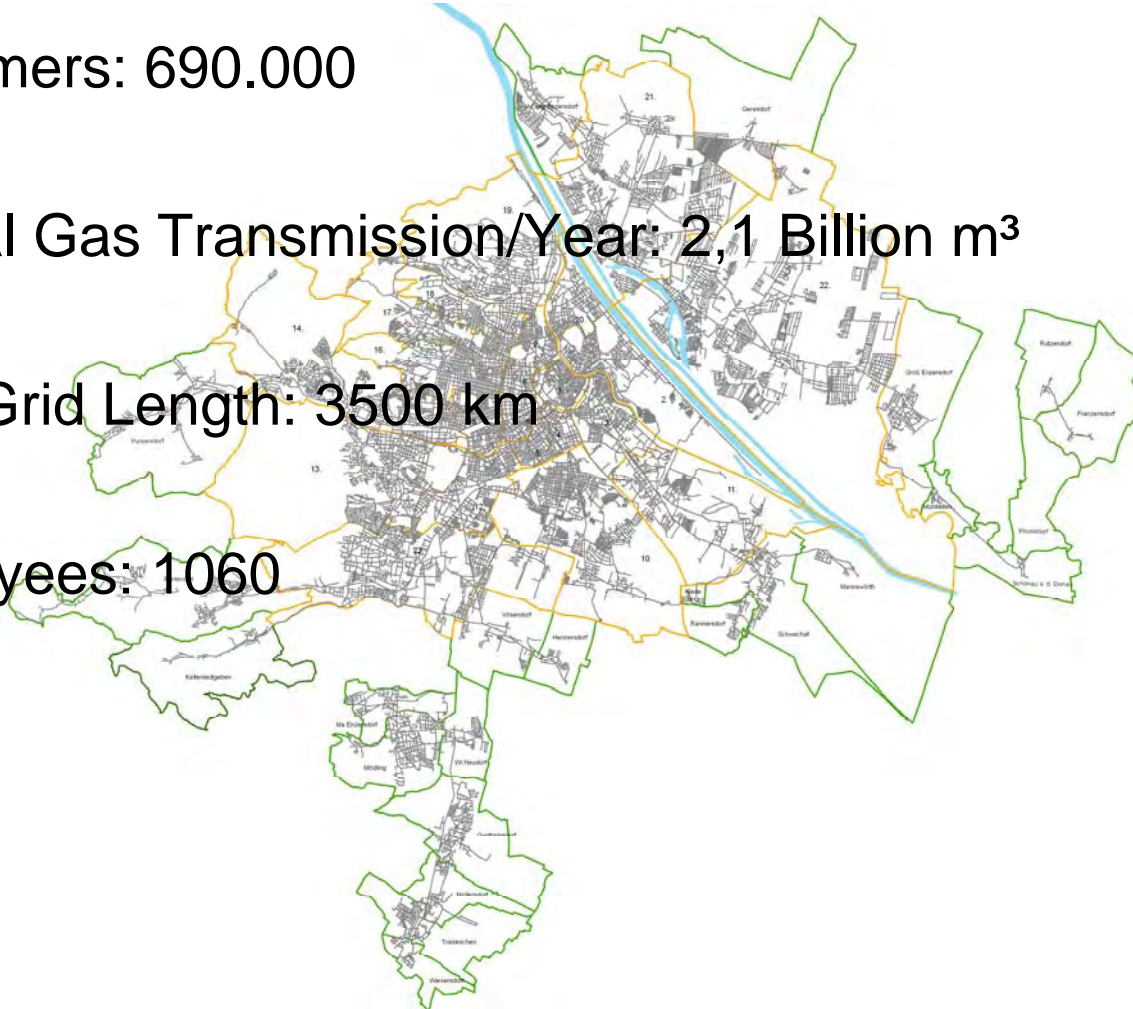
Advances in Grid Injection



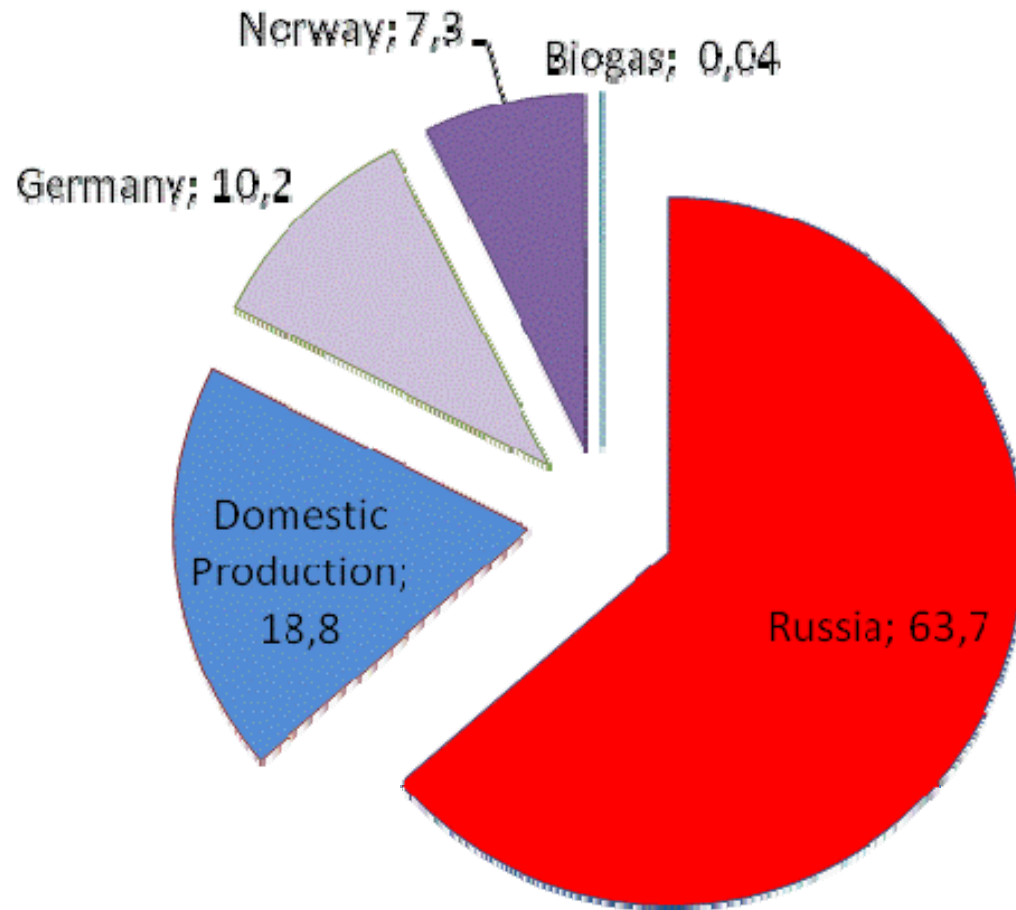
WIEN ENERGIE GmbH 100,00%		
ENERGIEALLIANZ Austria GmbH 45,00%	WIENSTROM GmbH 100,00%	
e&t Energie Handels GmbH 45,00%	WIENSTROM Beteiligungs- management GmbH 100,00%	Kraftwerk Nußdorf Errichtungs- und Betriebs GmbH 33,33%
Burgenland Holding AG 6,59%	WIENSTROM Naturkraft GmbH 100,00%	Kraftwerk Nußdorf Errichtungs- und Betriebs GmbH & Co KG 33,33%
WIEN ENERGIE Stromnetz GmbH 100,00%	WIENSTROM Naturkraft GmbH & Co KG 100,00%	WIEN ENERGIE Bundesforste Biomassekraftwerk GmbH 33,33%
WIEN ENERGIE Gasnetz GmbH 100,00%	B-S Energia Kft. 100,00%	WIEN ENERGIE Bundesforste Biomassekraftwerk GmbH & Co KG 33,33%
WIEN ENERGIE Erdgas Mobil GmbH 100,00%	WS Renewable Energy Hydro S.R.L. 100,00%	VERBUND Austrian Thermal-Power GmbH & Co KG 3,08%
WIEN ENERGIE Speicher GmbH 100,00%	Windnet Windkraftanlagenbetriebs GmbH 85,00%	VERBUND Austrian Hydro-Power AG 2,94%
WIEN ENERGIE Vertrieb GmbH & Co KG 33,33%	Windnet Windkraftanlagenbetriebs GmbH & Co KG 85,00%	APCS Power Clearing and Settlement AG 2,52%
Austria Ferngas GmbH in Liquidation 23,75%	WIEN ENERGIE Vertrieb GmbH & Co KG 68,67%	ECRA Emission Certificate Registry GmbH 2,41%
EconGas GmbH 15,70%	e&i EDV-Dienstleistungs GmbH 50,00%	EGE Einkaufsgenossenschaft der öster. Elektrizitätswerke GenmbH 1,87%
AGCS Gas Clearing and Settlement AG 5,49%	PAMA-GOLS Windkraft- anlagenbetriebs GmbH 50,00%	CISMO Integrated Services and Market Operations GmbH 1,28%
CISMO Integrated Services and Market Operations GmbH 2,74%	PAMA-GOLS Windkraft- anlagenbetriebs GmbH & Co KG 50,00%	VERBUND Österreichische Elektrizitätswirtschafts AG 1,13%
FERNWÄRME WIEN GmbH 100,00%	Toplak GmbH 50,00%	ARC Austrian Research Centers GmbH 0,46%
Geothermiezentrum Aspern GmbH 50,00%	Poliska Siła Wiatru SP.z.o.o 50,00%	
WIEN ENERGIE Bundesforste Biomassekraftwerk GmbH 33,33%	Energy Eastern Europe Hydro Power GmbH 49,00%	
WIEN ENERGIE Bundesforste Biomassekraftwerk GmbH & Co KG 33,33%	EPZ Energieprojekt Zumdorf GmbH 49,00%	
		ENERGIECOMFORT Energie- und Gebäudemanagement GmbH 100,00%
		C.E.U. s.r.o 100,00%
		Ausseer Fernwärme GmbH 100,00%
		Hauscomfort GmbH 100,00%
		Energiecomfort Hungary Energetik 100,00%
		SPRAVBYKOMFORT a.s. 55,00%
		Közegi Távhőszolgáltató Kft. 50,00%
		TT Energie s.r.o. 50,00%
		Ortswärme Seefeld GmbH 50,00%
		Ortswärme Oberstaufen GmbH 50,00%
		Ortswärme Oberstaufen GmbH & Co KG 100,00%
		Bytkomfort s.r.o 49,00%
		Bytkomfort-BA a.s. 100,00%
		Ortswärme Grän GmbH 24,88%
		Ortswärme Tannheim GmbH 24,88%
		RegioZ Regional Zuhilfenahme und Projektentwicklung Österreich und Sachsenweide GmbH & Co KG 4,27%

Company Profile Wien Energie Gasnetz GmbH

- Customers: 690.000
- Natural Gas Transmission/Year: 2,1 Billion m³
- Total Grid Length: 3500 km
- Employees: 1060



Natural Gas Sources (8 Billion m³/y)



Why are there no (or little advances)

- No economic incentive for grid injection
- Costs compared to Natural Gas
- Reservations about Gas Quality
- Big is beautiful



Main Conference Topics

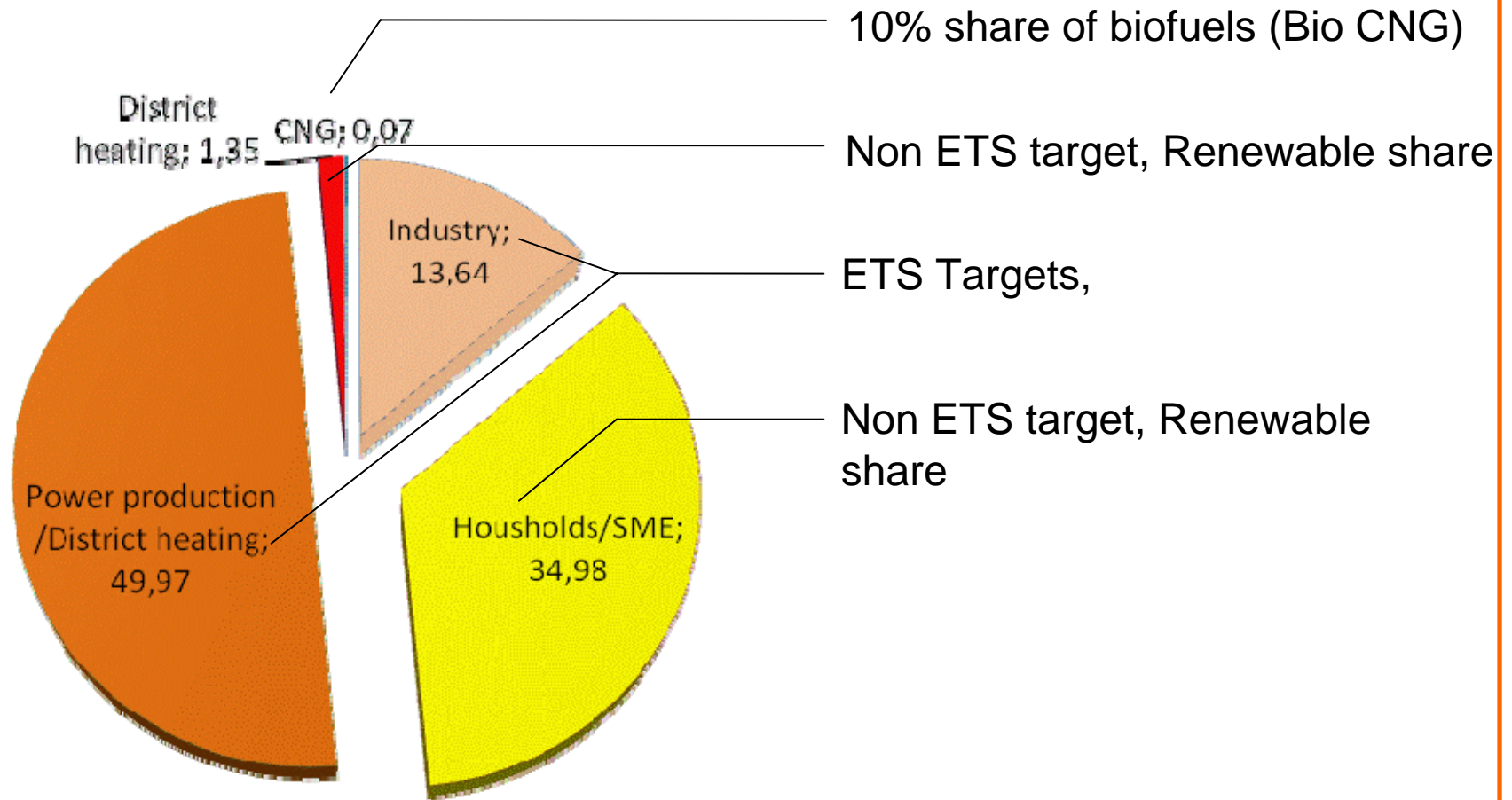
- 3rd Energy package
 - Separation of gas supply from trading (OU, ISO, ITO)
 - Harmonizing powers and duties of national regulators
 - Creation of a new European Regulation agency
 - Smart metering
- Security of Supply
 - Upgrading of Gas Transmission Systems
 - Advances in the development of LNG and storage infrastructure
 - Open up new natural gas resources (Nabucco...)
 - Establishment of natural Gas exchange (CEGH)
- Biogas Grid Injection ? : No Contribution

Why have to be advances in grid injection

The Climate action and renewable energy package

- Reduction of overall emissions to at least 20% by 2020 (below 2005 levels)
 - 21 % in ETS sector
 - 10 % Non ETS Sector (Austria -16%)
- Increase the share of renewables in energy use
 - 20% in total energy use (National target for Austria 36%)
 - 10 % minimum share for biofuels by 2020
- Cutting energy consumption by 20% of projected 2020 levels
- National Action plan (to be submitted until 30.06.2010)
 - Agreement on significant share of biogas in gas grids

Natural Gas usage Vienna (2 Billion m³/year)





Wien Energie Measures towards Grid Injection

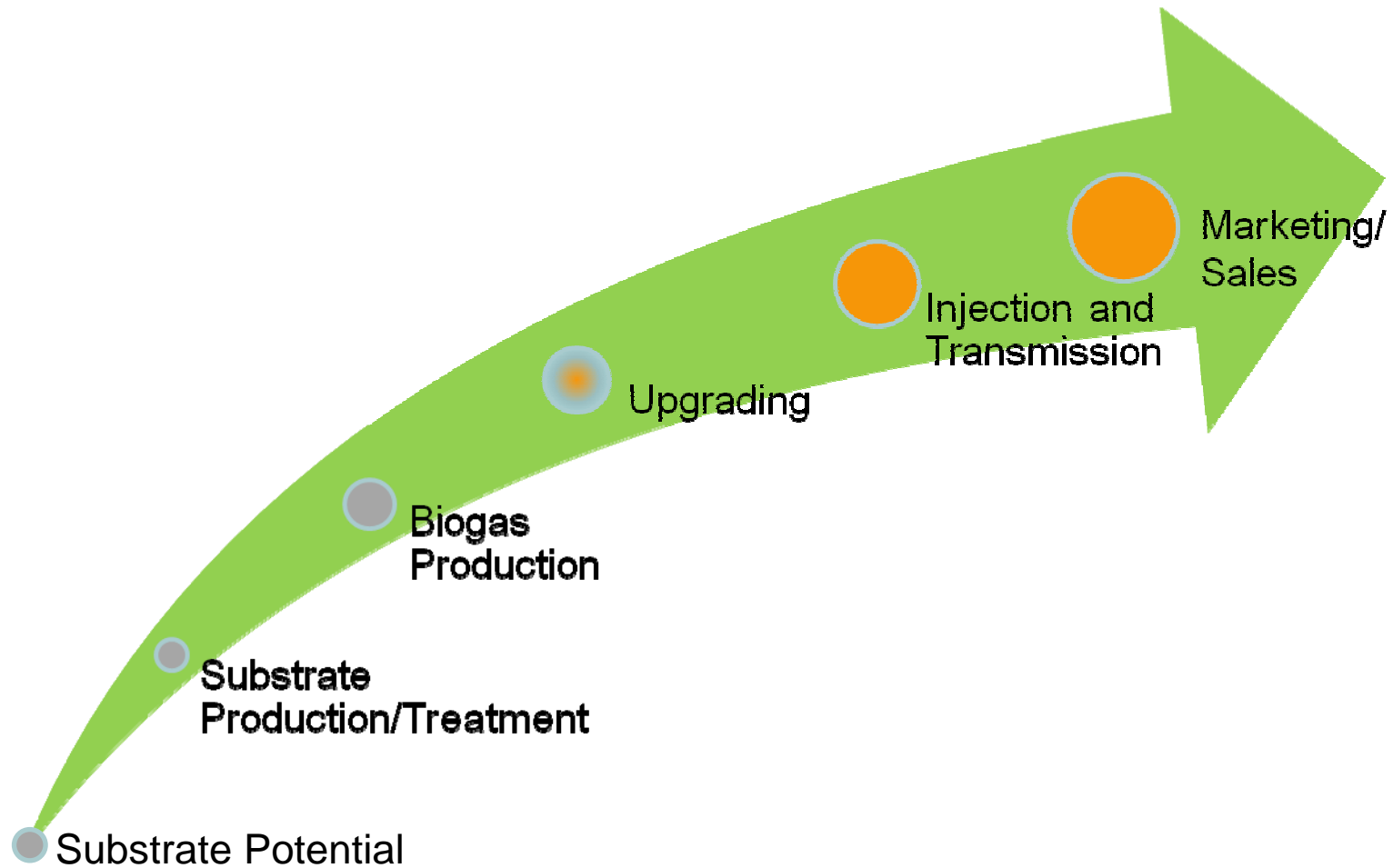
- Partner Project Bruck/Leitha
 - Full Scale Injection Project Bruck/Leitha
- Company Partner Bioenergy 2020+
 - R&D Efficiency Increase in Substrate Utilization
 - Optimization Upgrading Technology
- Feasibility Study
 - Analysis of Injection Potential for WEG



Feasibility Study: Objectives

- Substrate Potential
- Feasibility of short term potential (- 3 Years)
- Feasibility of mid term potential (- 5 Years)
- Feasibility of long term potential (10 years)

Feasibility Study: Value Added Chain





Feasibility Study: Evaluation Methodology

- Evaluation of Substrate Potential
 - High share of Organic Waste in Residual Waste (175.000 t/y)
 - Composition: Mainly Kitchen Waste and Food Products
 - Assumed Biogas Potential: 10.000.000 m³ (50% directed to Anaerobic Treatment)
- Grid Injection Point
 - Injection Grid: 4 bar Grid
 - High Interconnectability → High Availability of Injection Points
 - Restrictions: 41h on 30 days (2008)

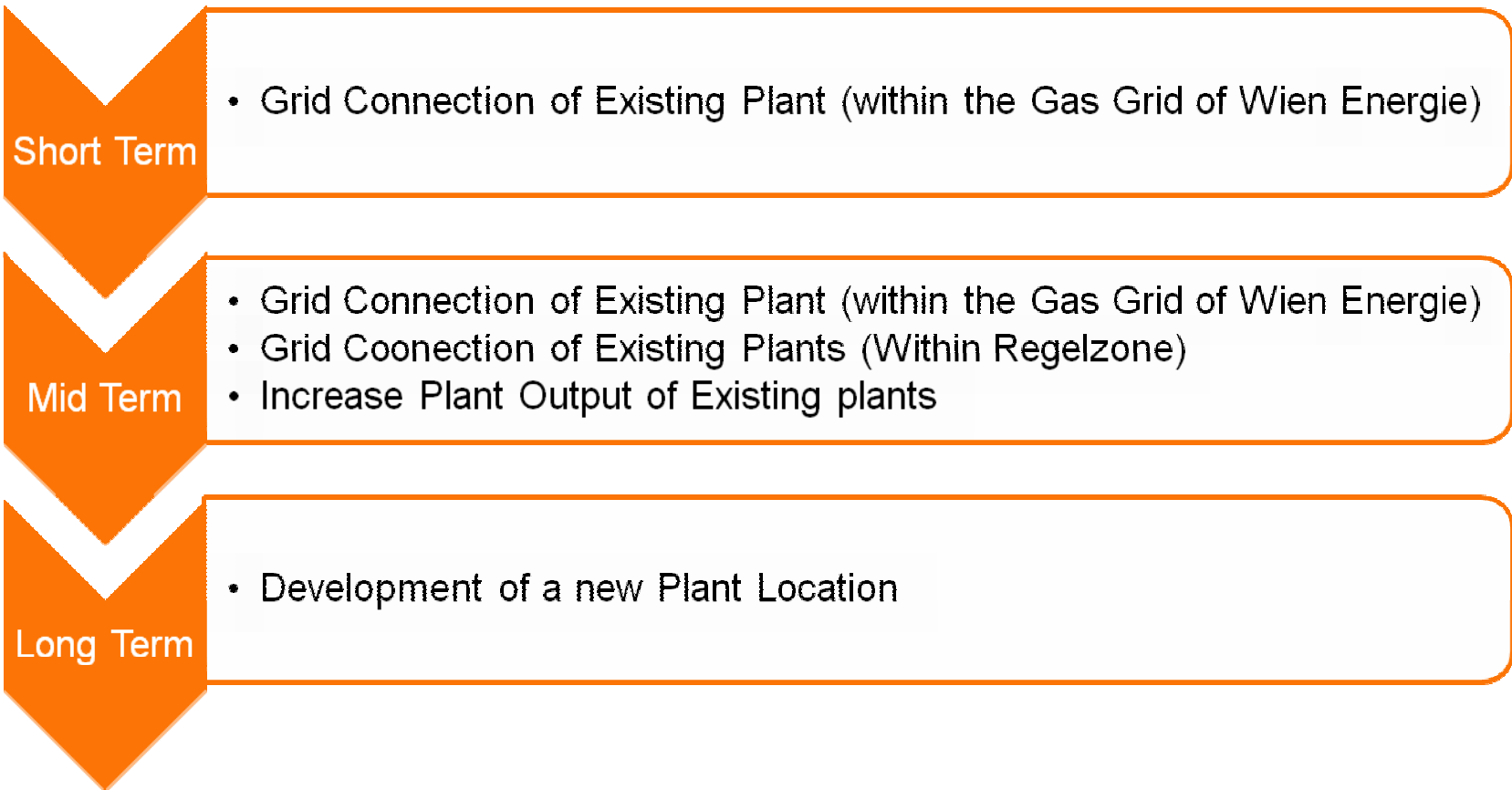
Feasibility Study: Injection Point



Feasibility Study: Evaluation Methodology

- Evaluation of Substrate Potential
- Grid Injection Point
- Evaluation Criteria
 - Substrate Availability, Source and Composition
 - Waste Treatment/ Anaerobic Digestion Technology/Plant Location
 - Upgrading Technology
 - Legal Compliance
 - Economic/ Operating Efficiency; Rating
- 5 Biogas Plants identified and evaluated

Potential Analysis: Conclusion





WIEN ENERGIE
— GASNETZ —

WIENER STADTWERKE
Es lebe die Stadt.

Es leben die
Stadtwunderwerke

Nr. 1 Mercer Studie 09 weltweit

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