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Feedback on Demand Response from Selected Industries

International EDRC Workshop| 16 February 2012

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Agenda

- Brimatech's role in the EDRC project
- Stakeholder and user groups
- Selection criteria (industries, size)
- Methodology, industries analyzed
- Reasons for not being interested in demand response (DR)
- Interest in DR systems and potential for DR by industry branch
- Summary of potential loads
- Conclusions & discussion

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Brimatech's Role in the EDRC Project

- **Identification of relevant stakeholders and user groups**
- **Identification of user needs and requirements**
- Research and analysis of possible business models (ongoing)

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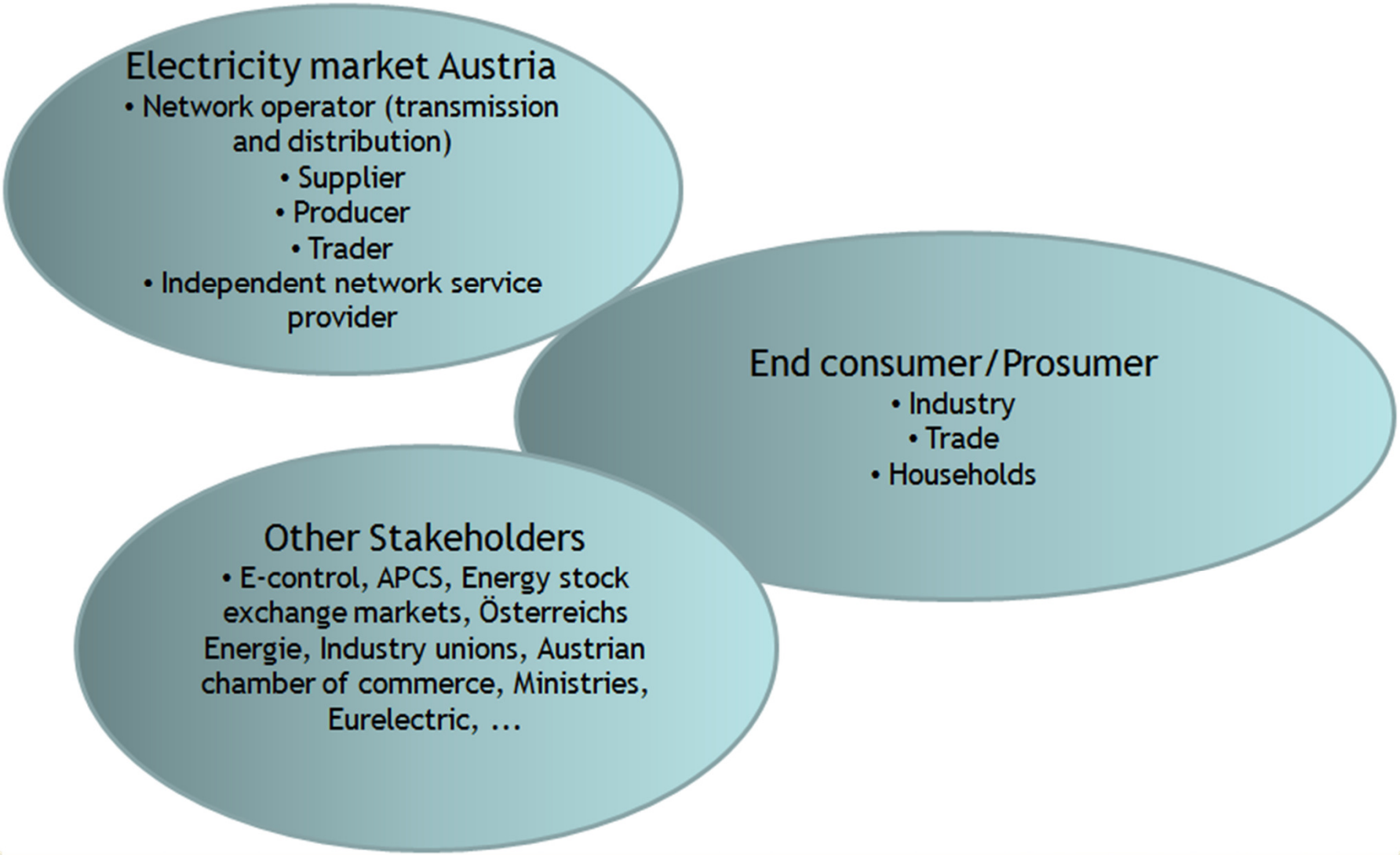
Stakeholders Austria



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Selected Industries

- Selected energy-intensive industries:
  - Paper, cardboard, pulp
  - Mining, industrial rocks, minerals
  - Iron, steel, non-ferrous metals
  - Chemical industry
  - Glass, ceramics, cement
  - Rubber and plastics
- Size: 250 employees minimum

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Methodology, Interviews

- Total of 70 companies were contacted, 36 interviews conducted
- Face to face and telephone interviews, follow-up questionnaire
- Contents: „soft facts“ (e.g. experience with DR, interest) and „hard facts“ (switchable loads)

Industry Branch	No. of short interviews	No. of problem-centred interviews
Paper, Cardboard, Pulp	5	6
Minining, Industrial Rocks, Minerals	6	0
Iron, Steel, Non-ferrous Metals	2	3
Chemical Industry	2	3
Glass, Ceramics, Cement	0	3
Rubber and Plastics	5	1

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Few industries showed no interest

- One paper producing company is already actively engaged in DR (own balance group).
- Non-participation due to production processes:
  - Salt refinery
  - Rubber/plastics: low interest where production involves extrusion or injection moulding processes
  - Packaging: high cost of waste, highly integrated
- Resistance to DR (interference with internal processes)
  - Industry independent
  - Energy efficiency is already high on the agenda; DR is perceived as an „additional complication“

Paper, Cardboard, Pulp

- Paper, Cardboard
  - Very interested in DR
  - Paper/cardboard machines cannot be used
  - Pulp/pressure grinders can be used
  - Steam turbines
  - Investments in storage may be necessary
- Pulp
  - Low level of interest in DR
  - Electricity is a by-product in the production
  - Mills supply electricity to the network

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Iron and Steel, Non-ferrous Metals

- Very interested in DR
- Electric Arc Furnace (EAV) – „predestined“ for DR technologies
  - high connected load
  - can be turned off in less than one minute (automatically)
- Other parts of production are harder to switch
  - theoretically the mill
  - or secondary ovens

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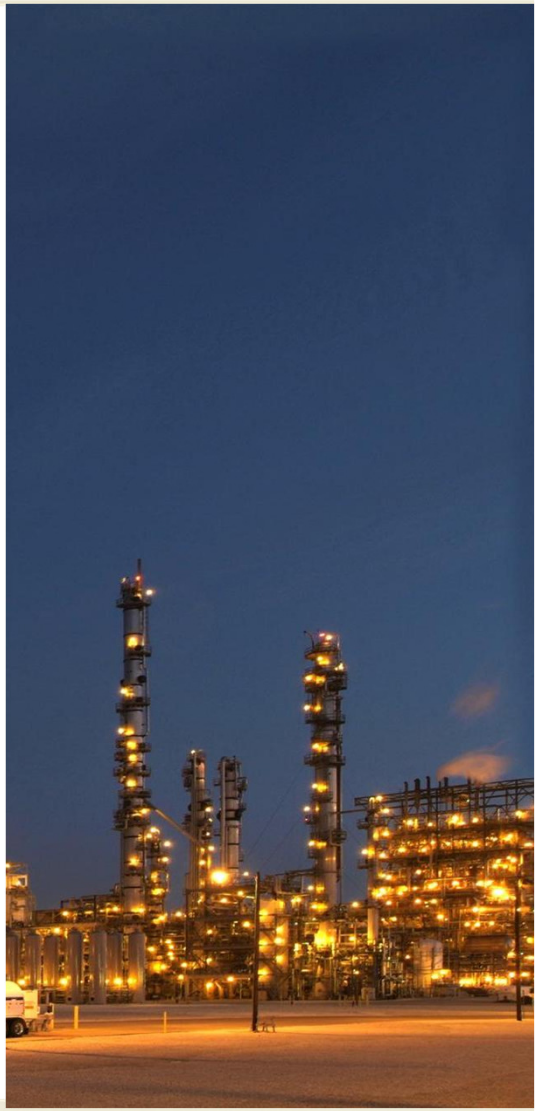
Chemical Industry

- Interested in DR
- Electrolysis
- Ammonia production: DR cannot interfere too often (danger of equipment damage)
- Longer reaction times
- Can be switched off for longer periods (a few hours to a few days) in summer in particular



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Glass, Ceramics, Cement

- The cement industry in particular is very interested in DR systems
- Companies have investigated potentials by themselves and are “waiting for” DR systems
- Cement mills in particular can be switched off
  - quickly and
  - for longer periods of time (hours)

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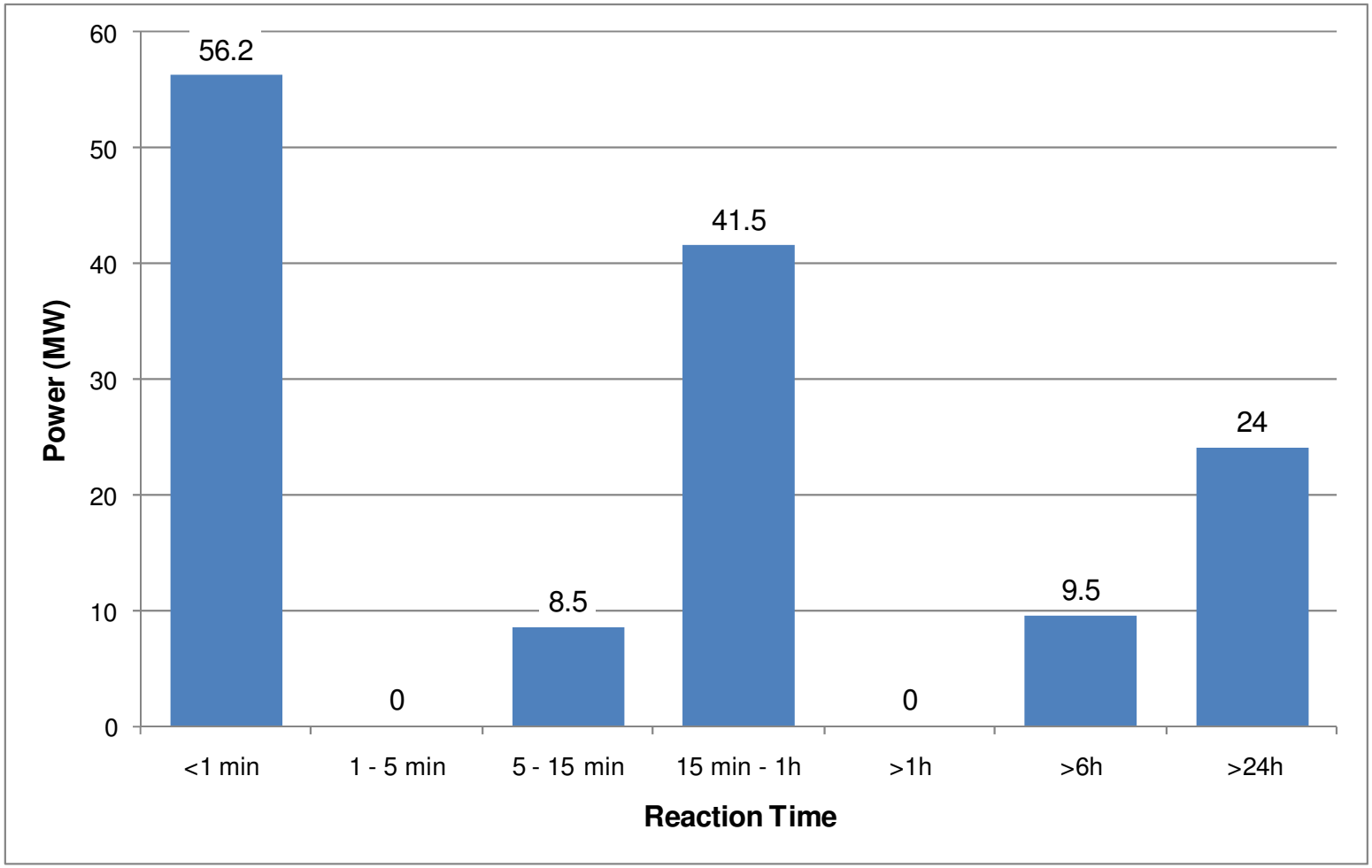
Potential for DR I



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Potential for DR II

	MW by Industry / Reaction Time							
	<1 min	**1 - 5 min**	**5 - 15 min**	**15 – 60 min**	**>1h**	**>6h**	**>24h**	**Total (MW)**
Paper, Cardboard, Pulp	4,5	-	6	36,5	-	-	-	**47**
Mining, Industrial Rocks and Minerals	-	-	-	-	-	-	-	**-**
Iron and Steel, Non-ferrous Metals	51	-	2,5	5	-	-	-	**58,5**
Chemical Industry	-	-	-	-	-	-	24	**24**
Glass, Ceramics, Cement	0,7	-	-	-	-	9,5	-	**10,2**
Rubber and Plastics	-	-	-	-	-	-	-	**-**
Total (MW)	**56,2**	**-**	**8,5**	**41,5**	**-**	**9,5**	**24**	**139,7**

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Conclusions

- There is a significant potential for DR technologies in Austria.

- Industries of particular interest are:
  - Paper, Cardboard
  - Steel
  - Cement
  - Chemical Industry

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