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Tar measurement at VUT

Solvent Comparison

Milano, 21.06.2012

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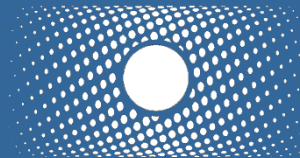




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- Comparison of the tar guideline and in house method
- Tar sampling with two different solvents



Dual Fluidized Bed Steam Gasification

- Steam as gasification agent
- High water content in product gas (25-45 %)
- Various plants
 - Pilot plant VUT 100 kW
 - CHP plant Güssing 8 MW
 - CHP plant Oberwart 8.6 MW
 - CHP plant Villach 15 MW

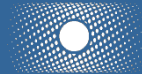




Dual Fluidized Bed Steam Gasification

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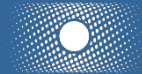




Difference of Tar Guideline and in house method

- Solvent: Toluene
 - No determination of BTX possible
- Soxhlet extraction: Isopropanol
 - Two samples for GC/MS tar and gravimetric tar
- Measurability of the water content (volumetric)
- Temperature of cooling bath (-8° C)
- Use of glass petri dishes for gravimetric tar determination
 - 12 h evaporate in ambient atmosphere
 - 6 h in heating oven



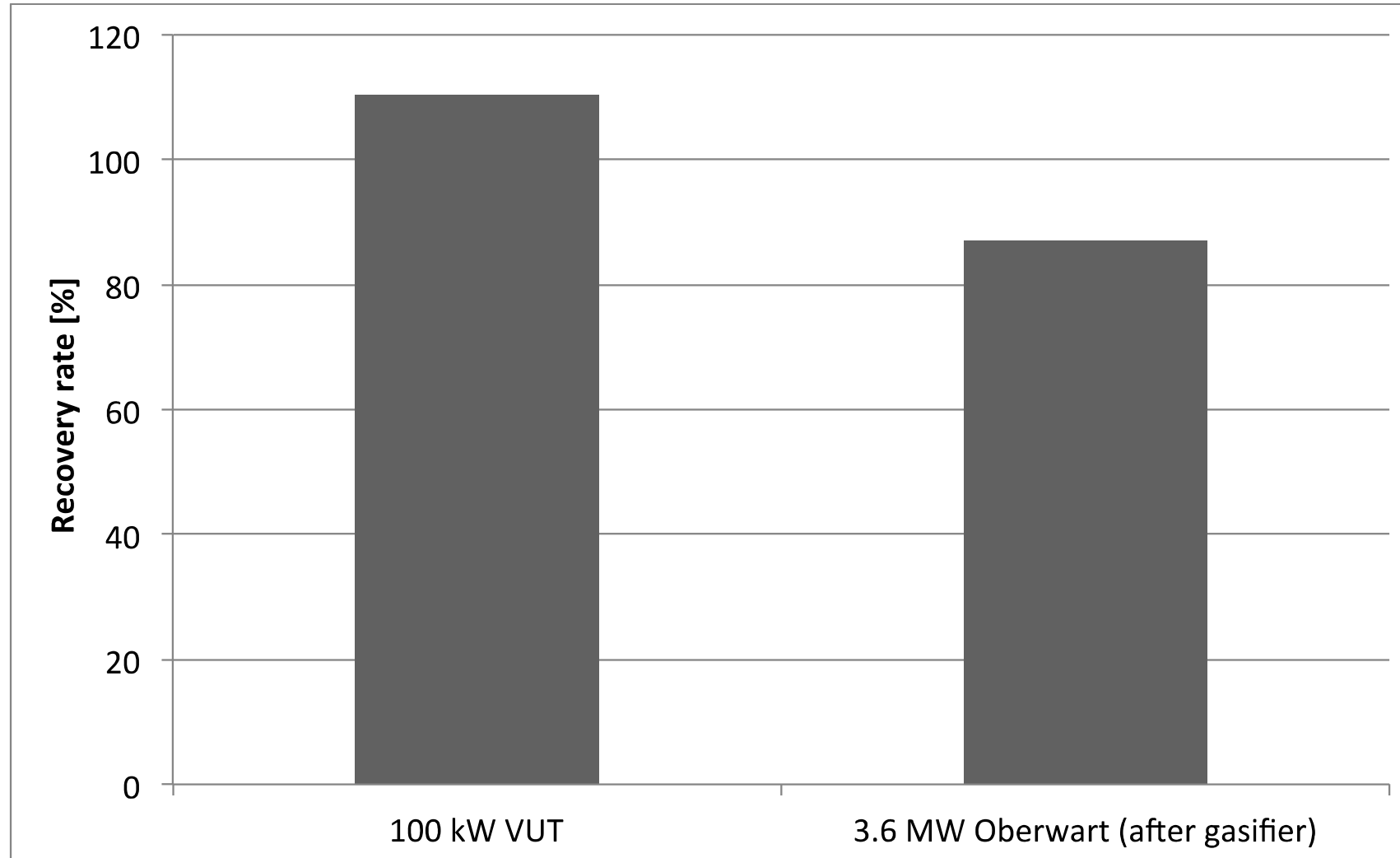


Tar measurement

- 100 kW pilot plant at VUT
 - Measurement point after gasifier (sample time 8 min)
 - Tar (gravimetric and GCMS)
 - Water content
 - Particle (char and dust)
- 8.6 MW CHP plant Oberwart
 - Measurement point after gasifier (sample time 8 min)
 - Tar (gravimetric and GCMS)
 - Water content
 - Particle (char and dust)
 - Measurement point after RME scrubber (sample time 30 min)
 - Tar (gravimetric and GCMS)
 - Water content

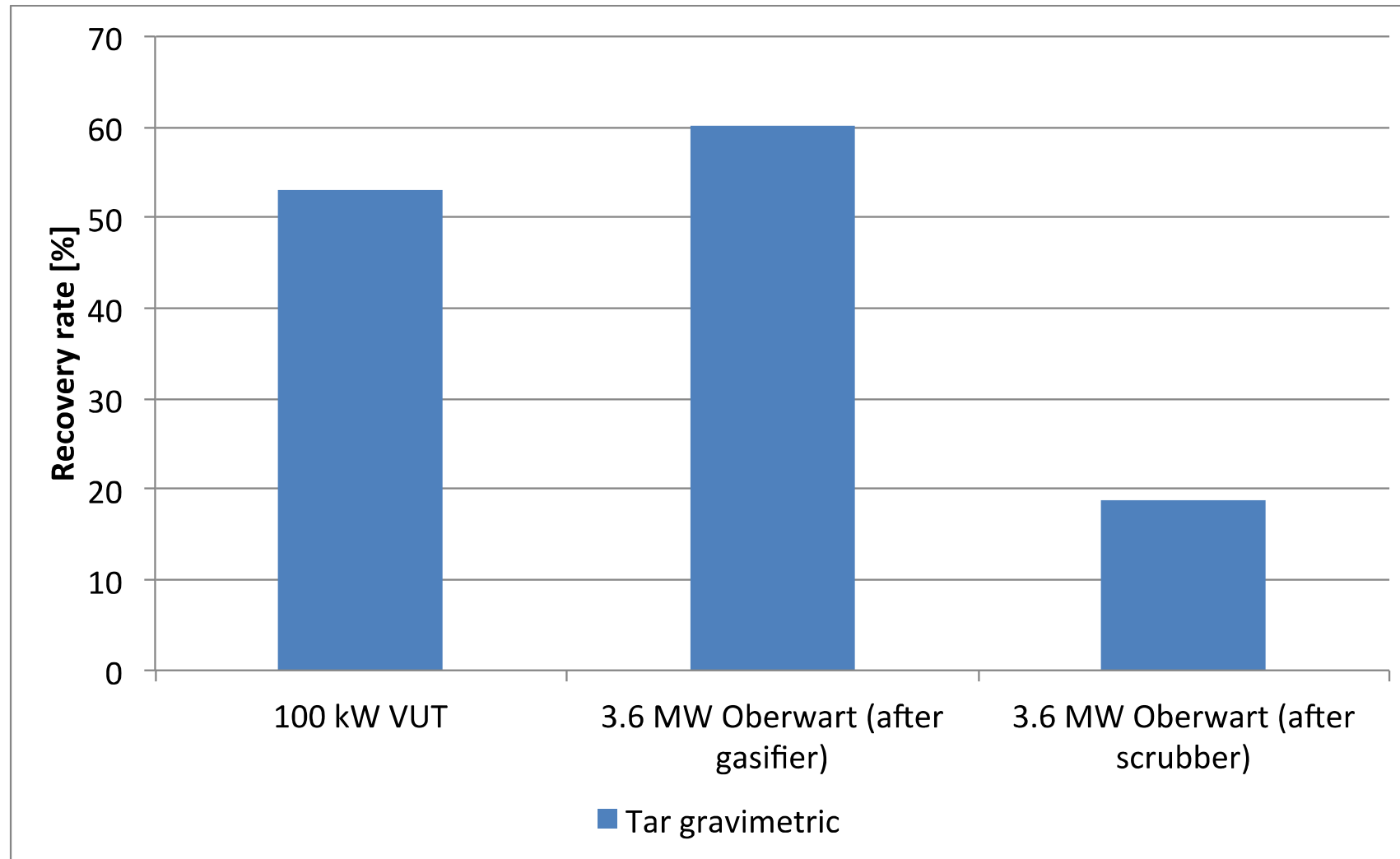


Recovery rate: particle (sum of char and dust)



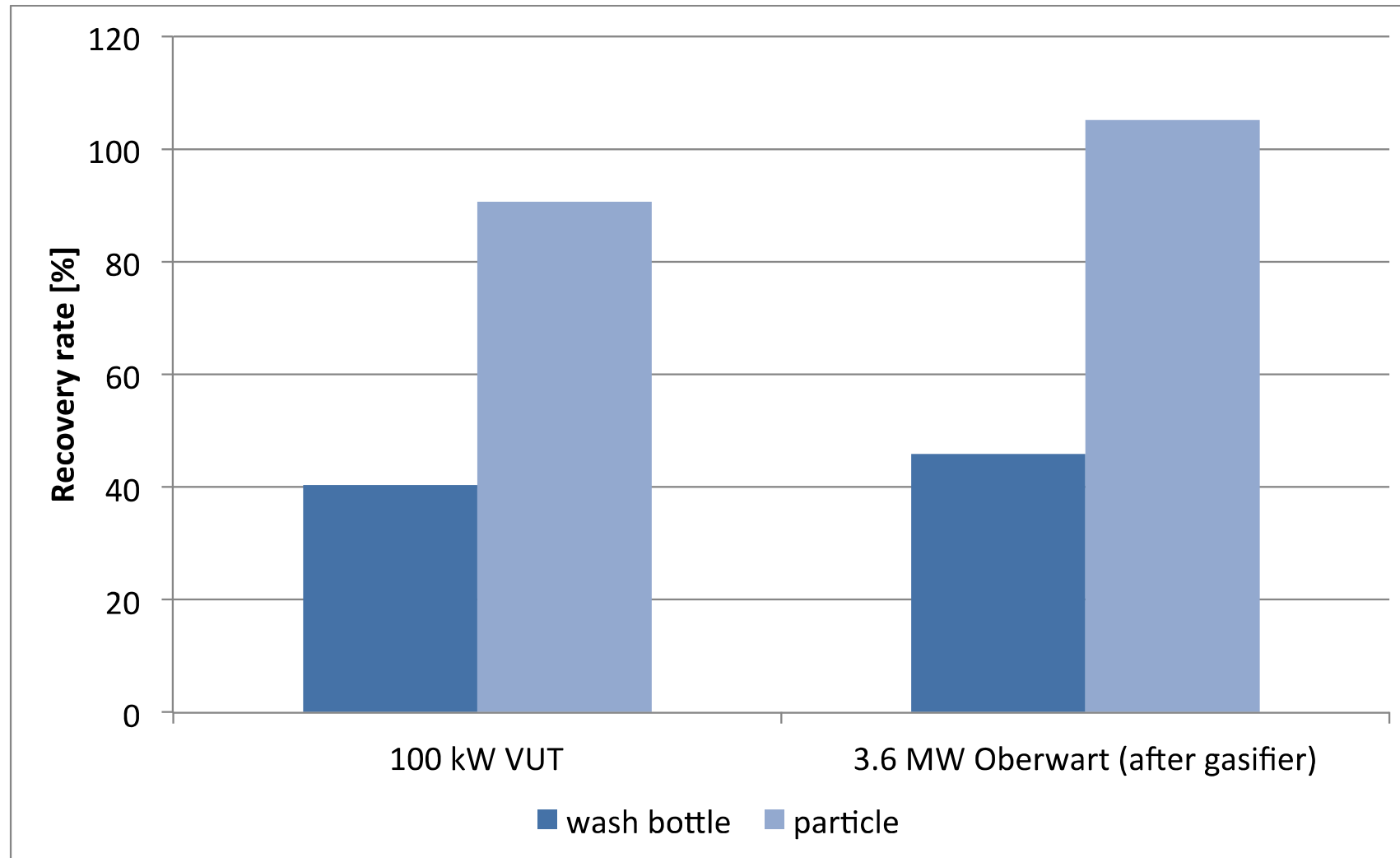


Recovery rate: tar gravimetric



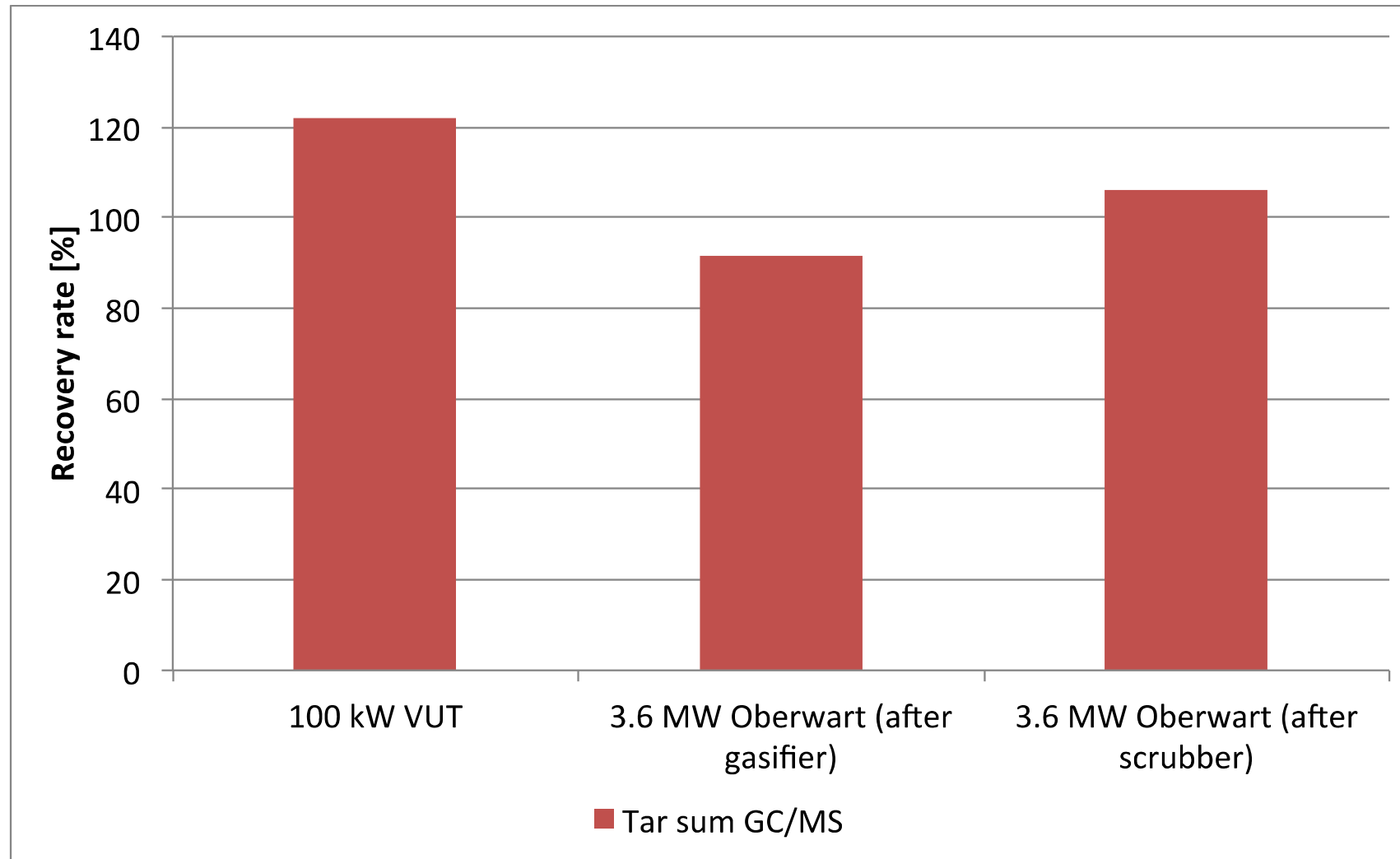


Recovery rate: tar gravimetric



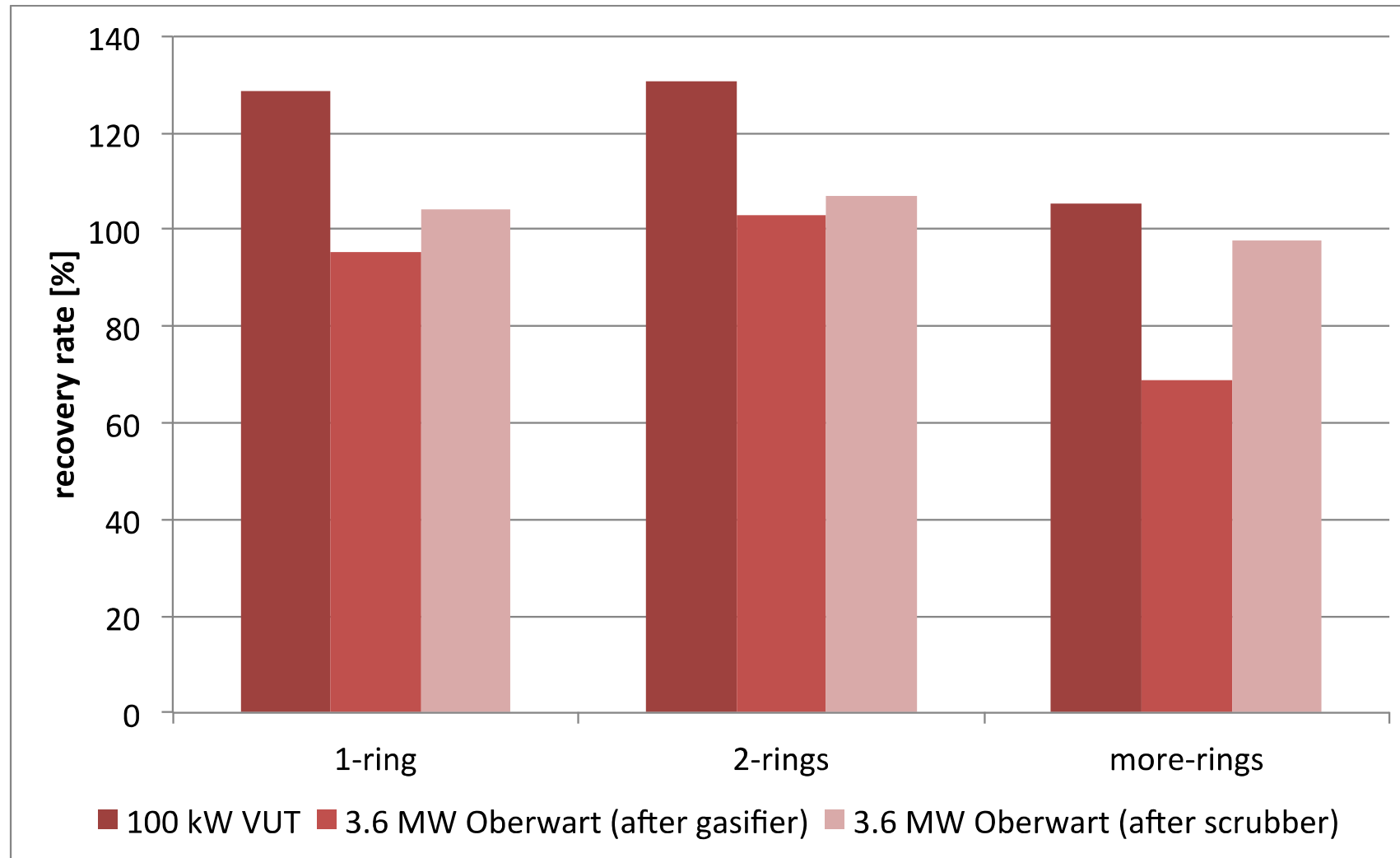


Recovery rate: tar GC/MS





Recovery rate: tar GC/MS





Summary

- Recovery rate [%]

	Particle	Gravi. tar	GC/MS tar
100 kW VUT	110	53	122
3.6 MW Oberwart (after gasifier)	87	60	91
3.6 MW Oberwart (after scrubber)	-	19	106

- Difference between gravimetric tar from wash bottles and from Soxhlet extraction
- Increase in the molecular weight – decrease of the recovery rate (solubility)
- Recovery rate for GC/MS higher as for gravimetric tar
- No direct determination of water content possible
- Longer suction time – decreasing recovery rate (dilution)

Thank you for the attention.
Any questions ?

Milano, am 21.06.2012

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