



Bioenergy NoE



Residential Waste

-

an often overlooked bioenergy source



J. Vehlow

**Forschungszentrum Karlsruhe GmbH
Institute for Technical Chemistry / Thermal Waste Treatment Division**

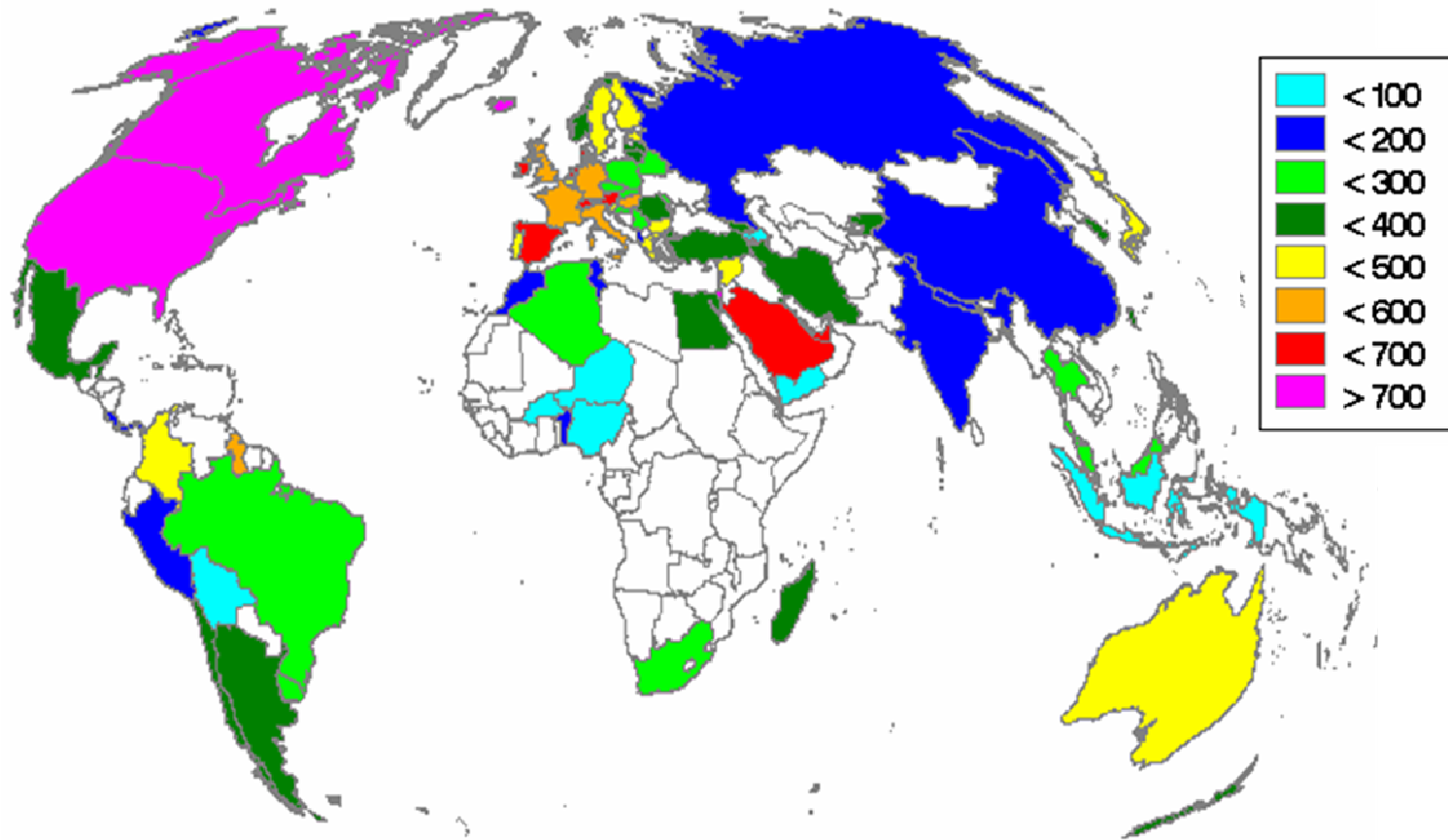


specific drivers for energy recovery from waste

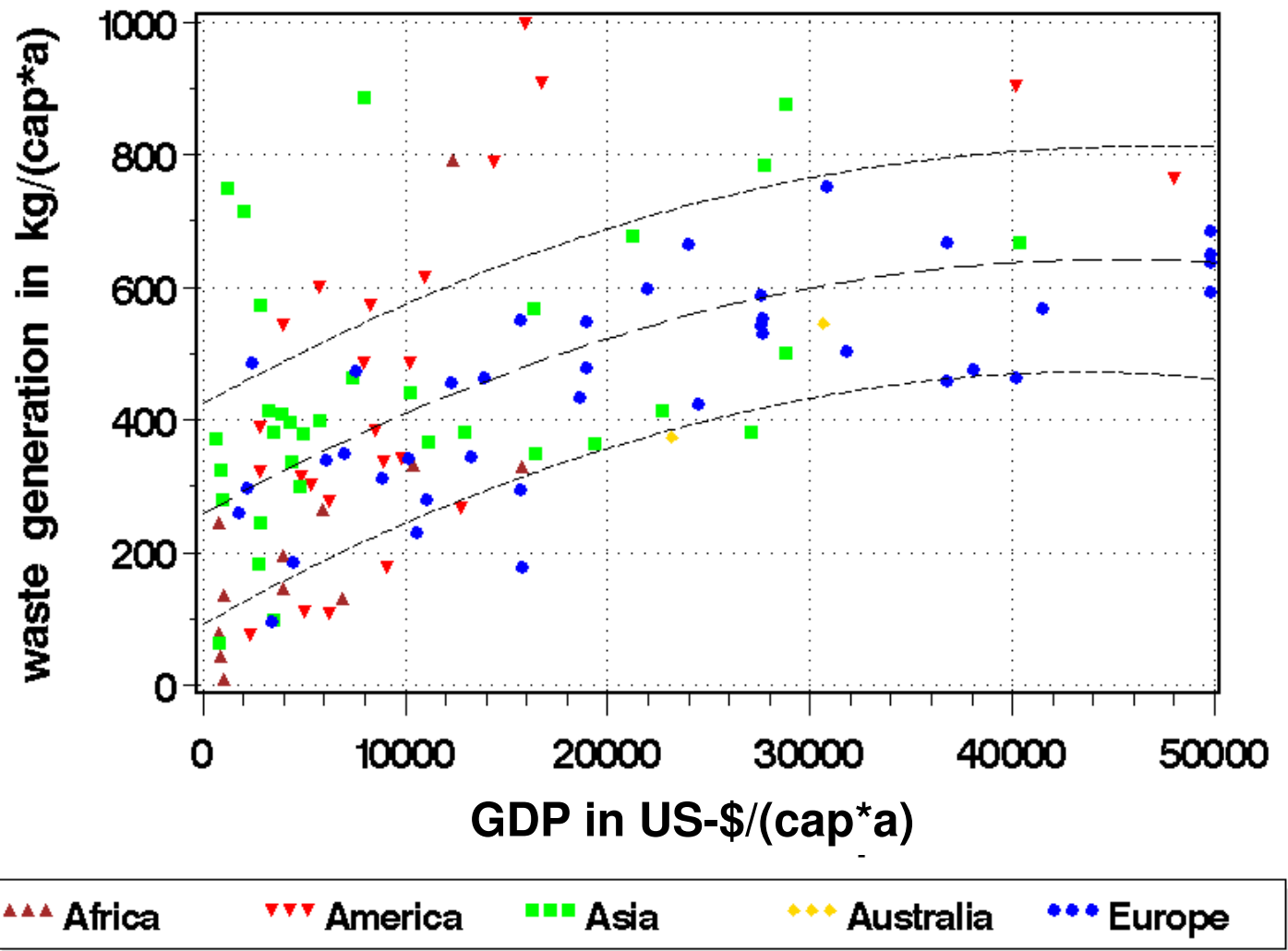
modern waste management strategies for aftercare-free disposal

- ▶ **ban of direct landfilling of reactive waste to avoid**
 - landfill gas evolution (climate protection)
 - leachate formation (groundwater protection)

- ▶ **inertisation prior to final disposal**
 - preferentially by waste incineration
 - demand for residue utilisation and
 - energy recovery



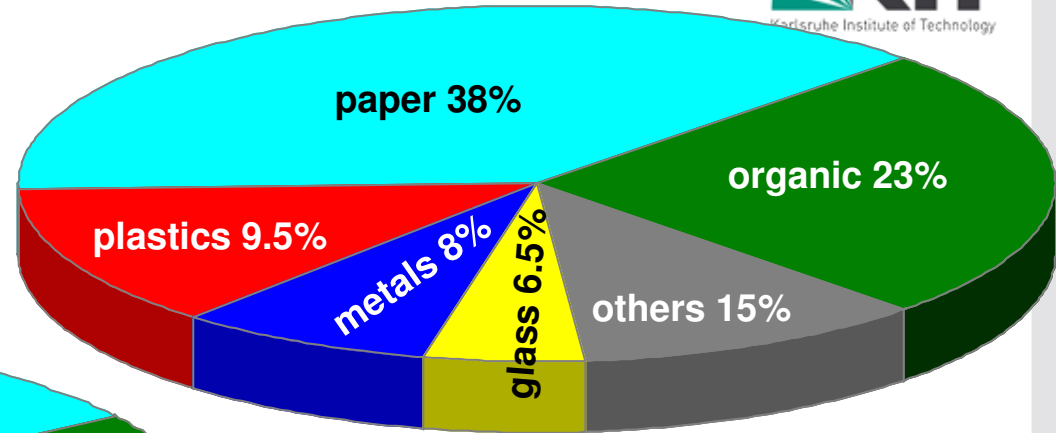
generation of MSW in kg/(cap*a)



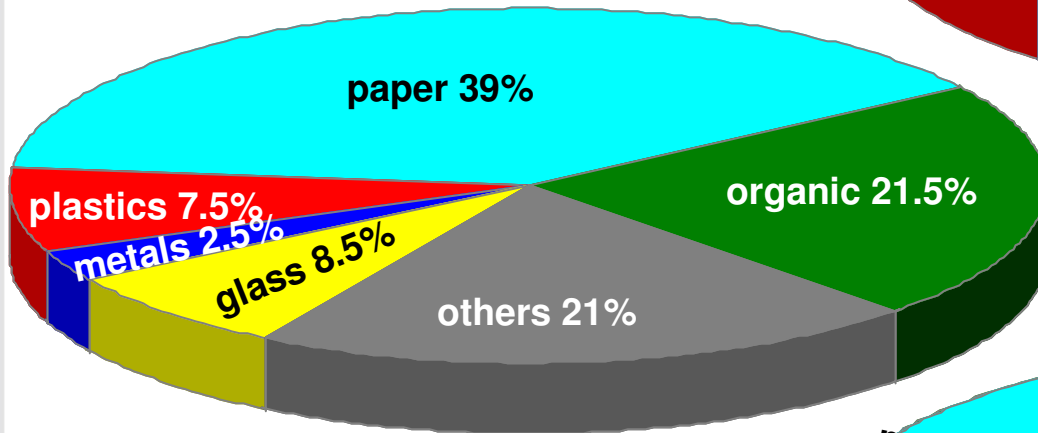
waste generation versus GDP



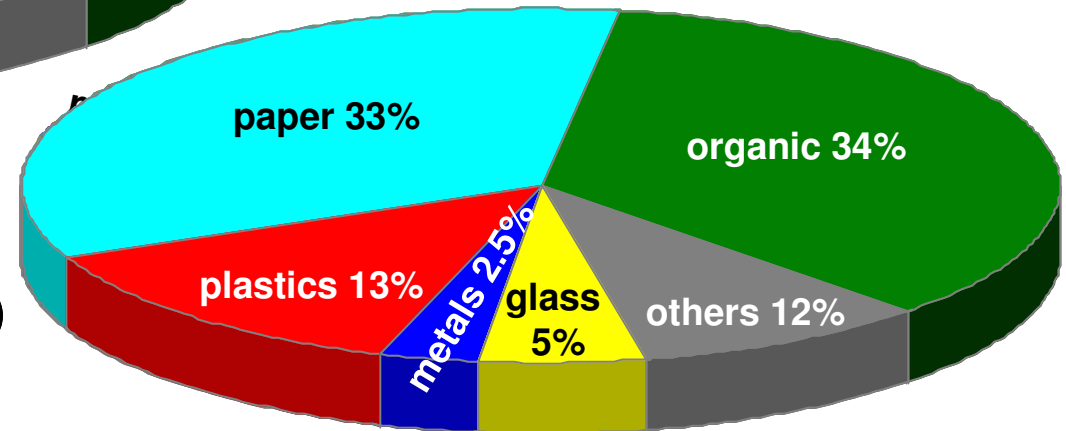
USA 770 kg/(cap*a)



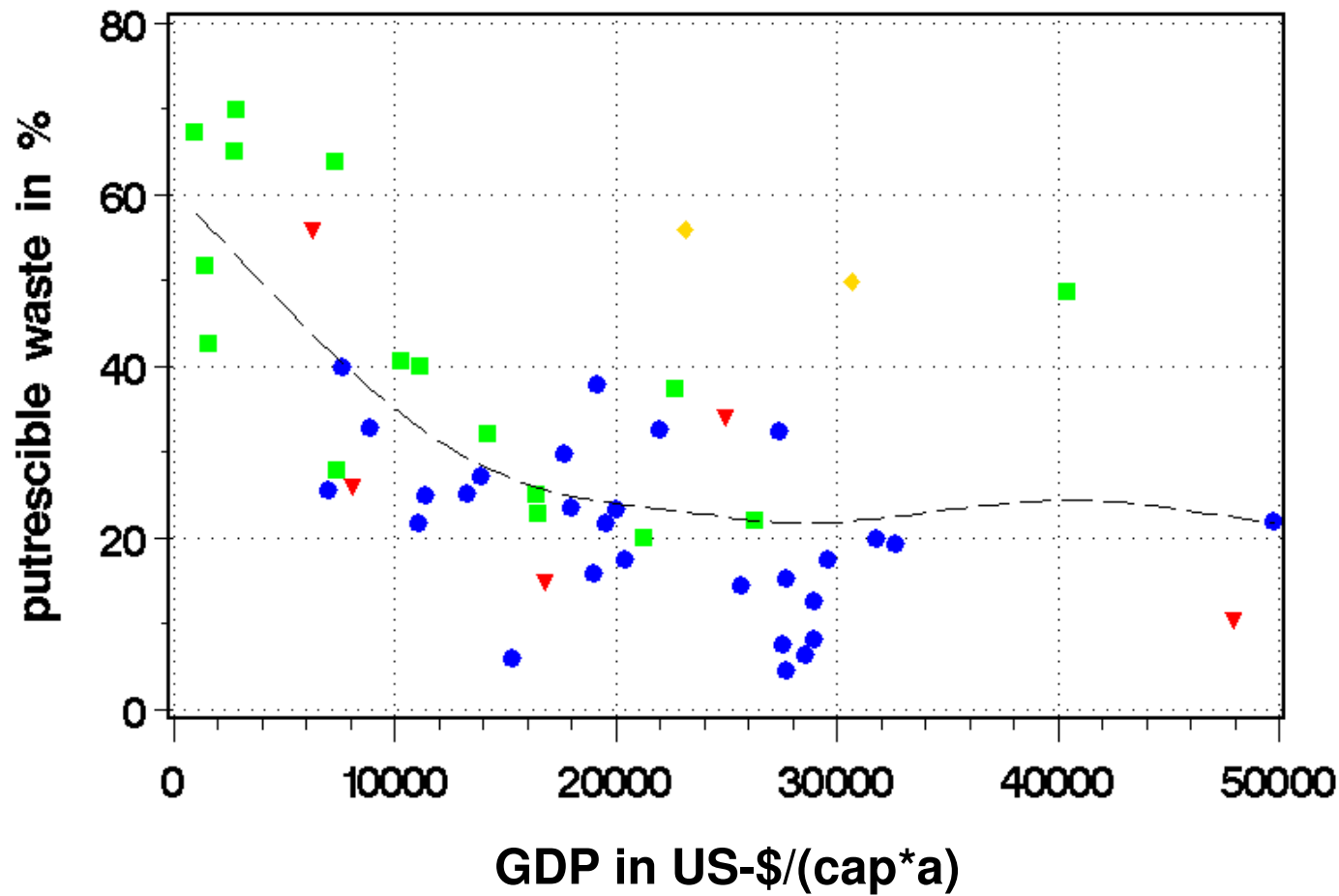
Germany 570 kg/(cap*a)



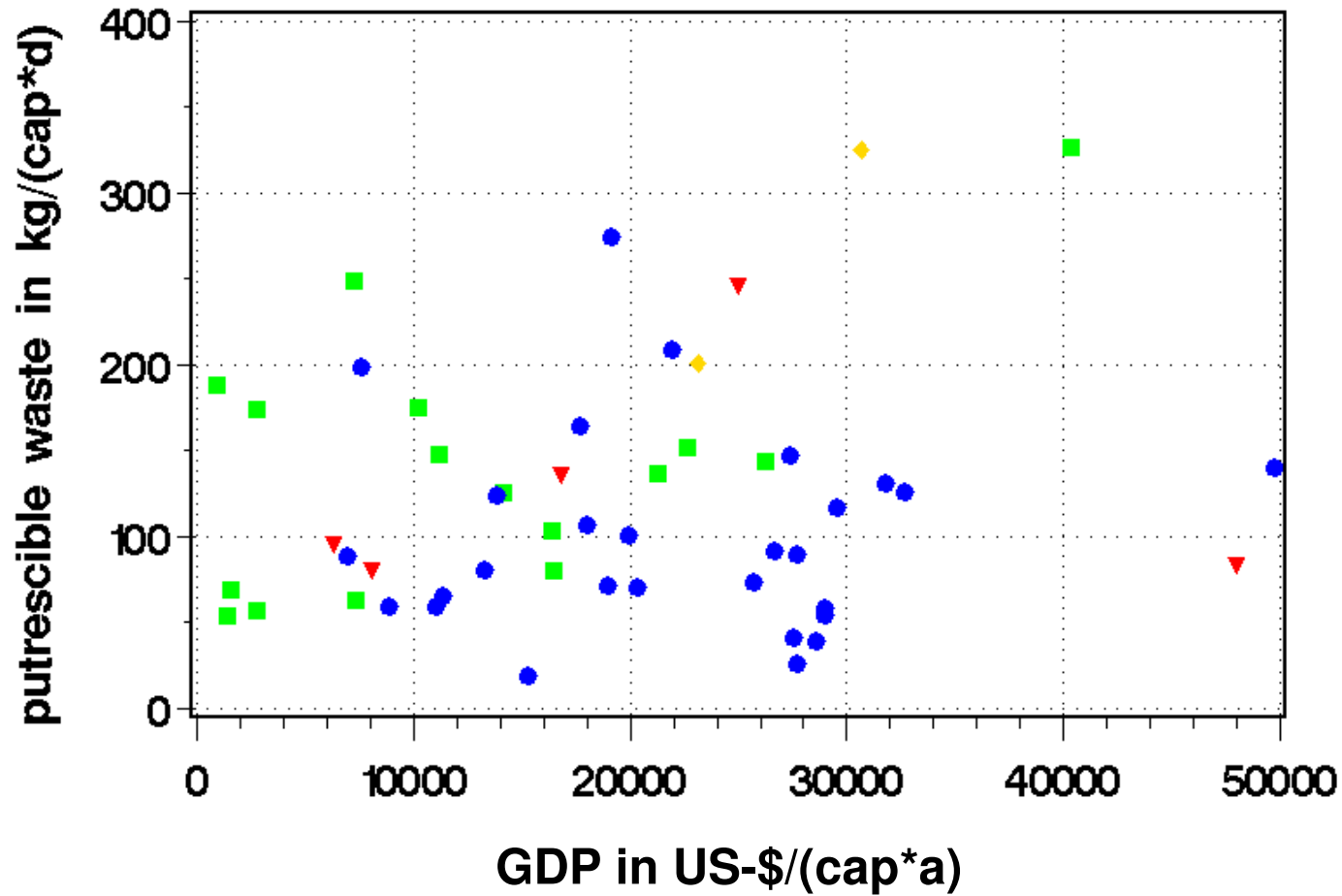
**Vietnam
400 kg/(cap*a)**



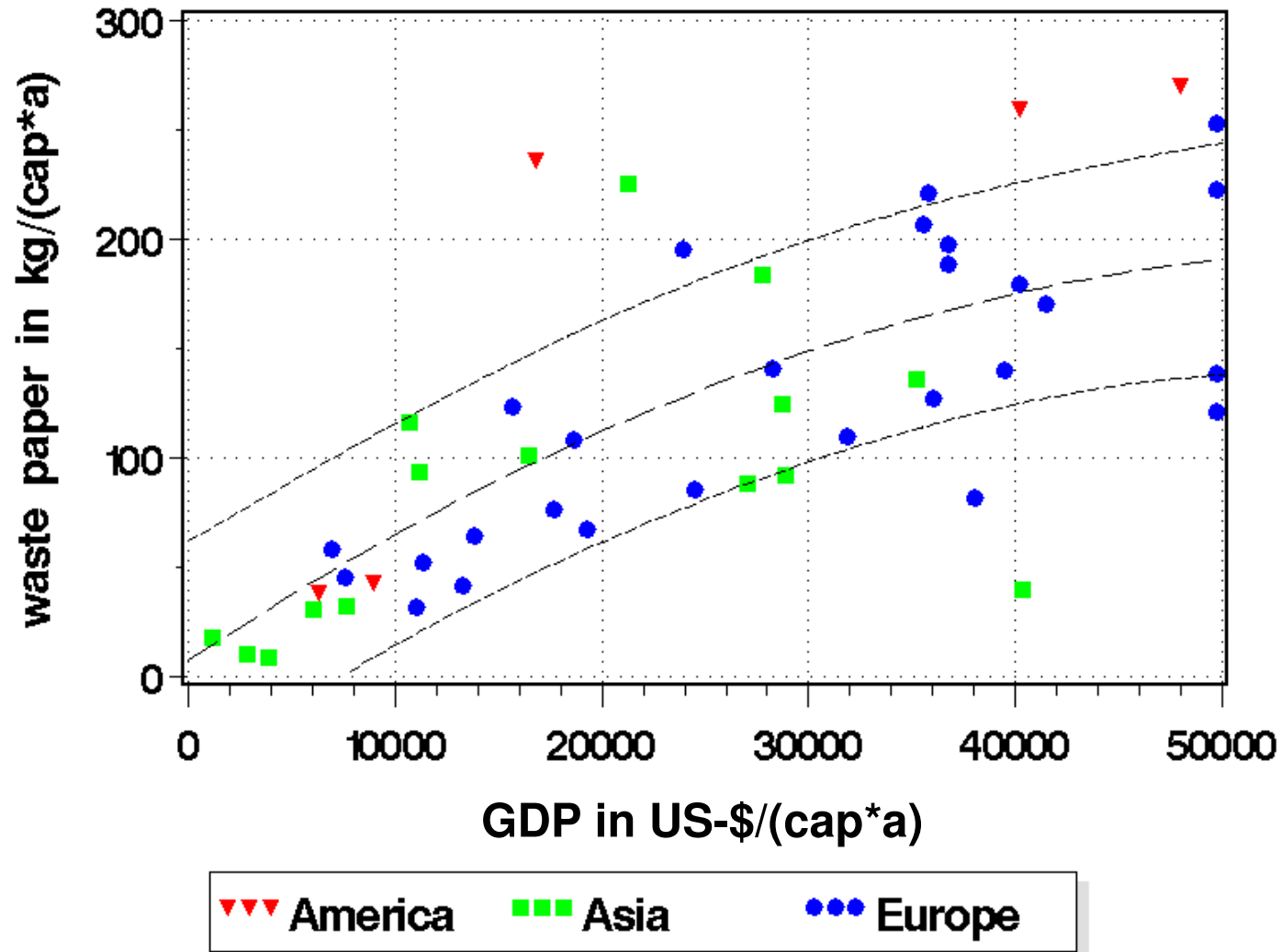
waste composition



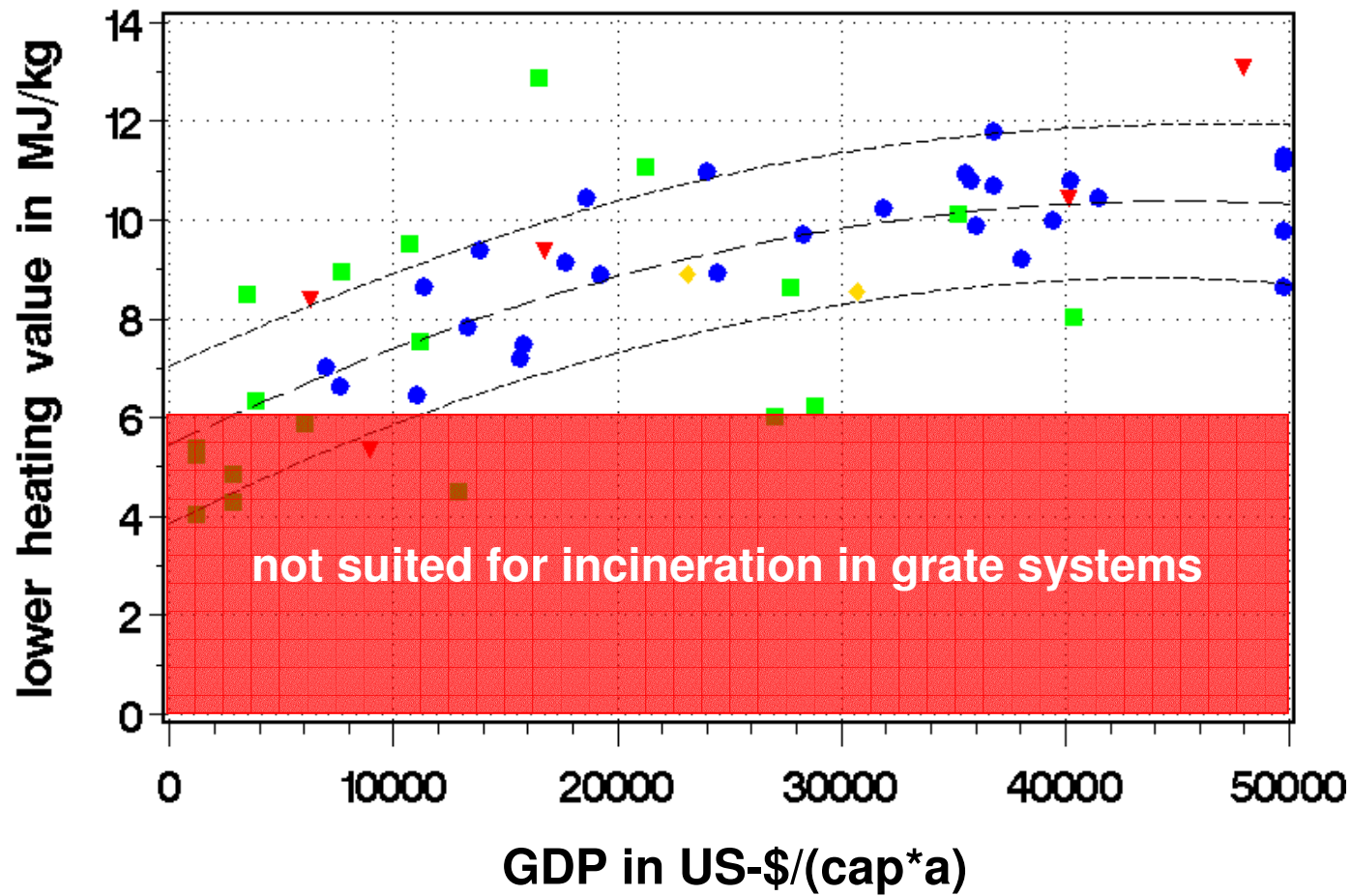
share of organic waste versus GDP



generation of organic waste versus GDP



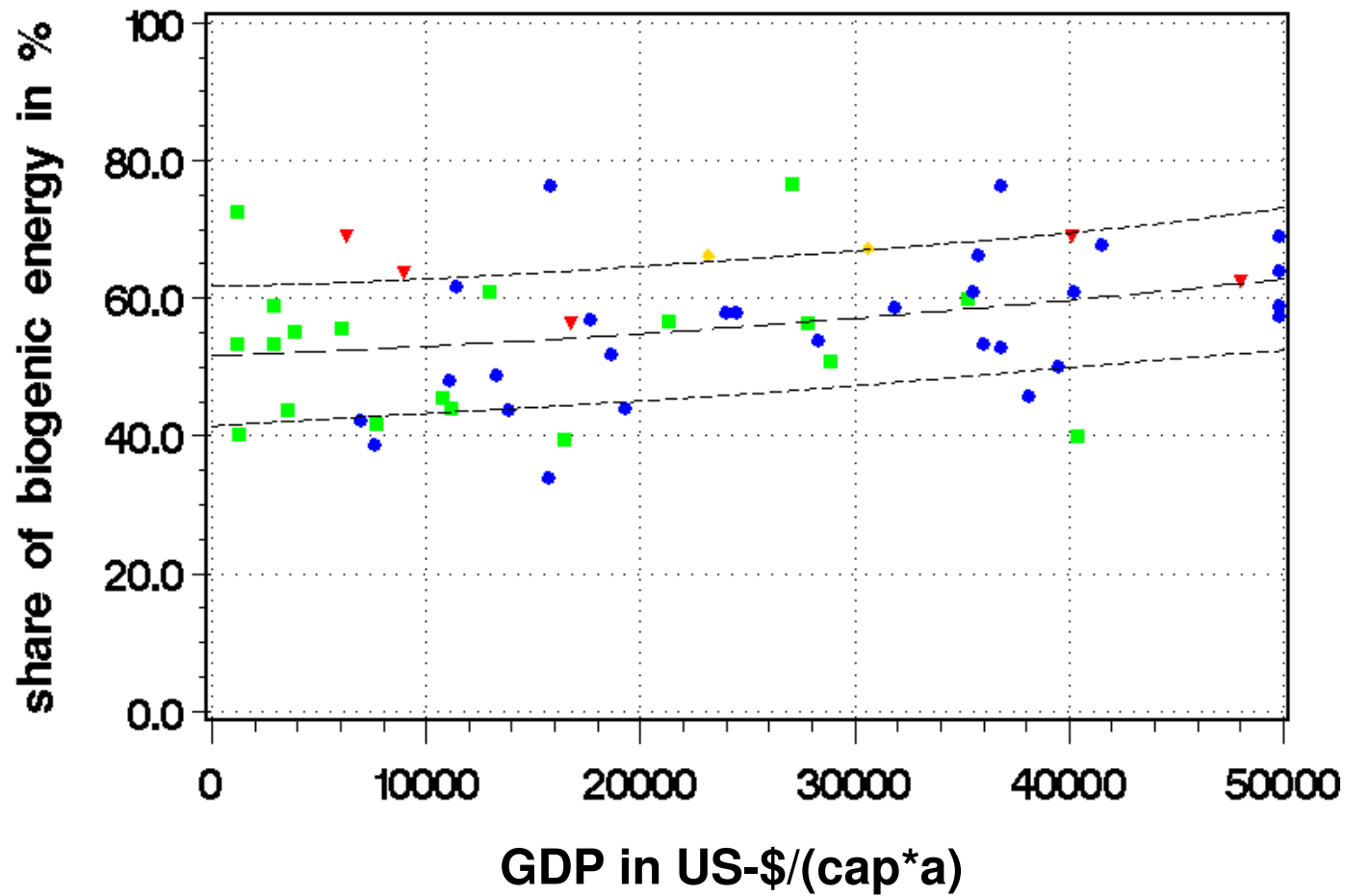
generation of waste paper versus GDP



lower heating value versus GDP

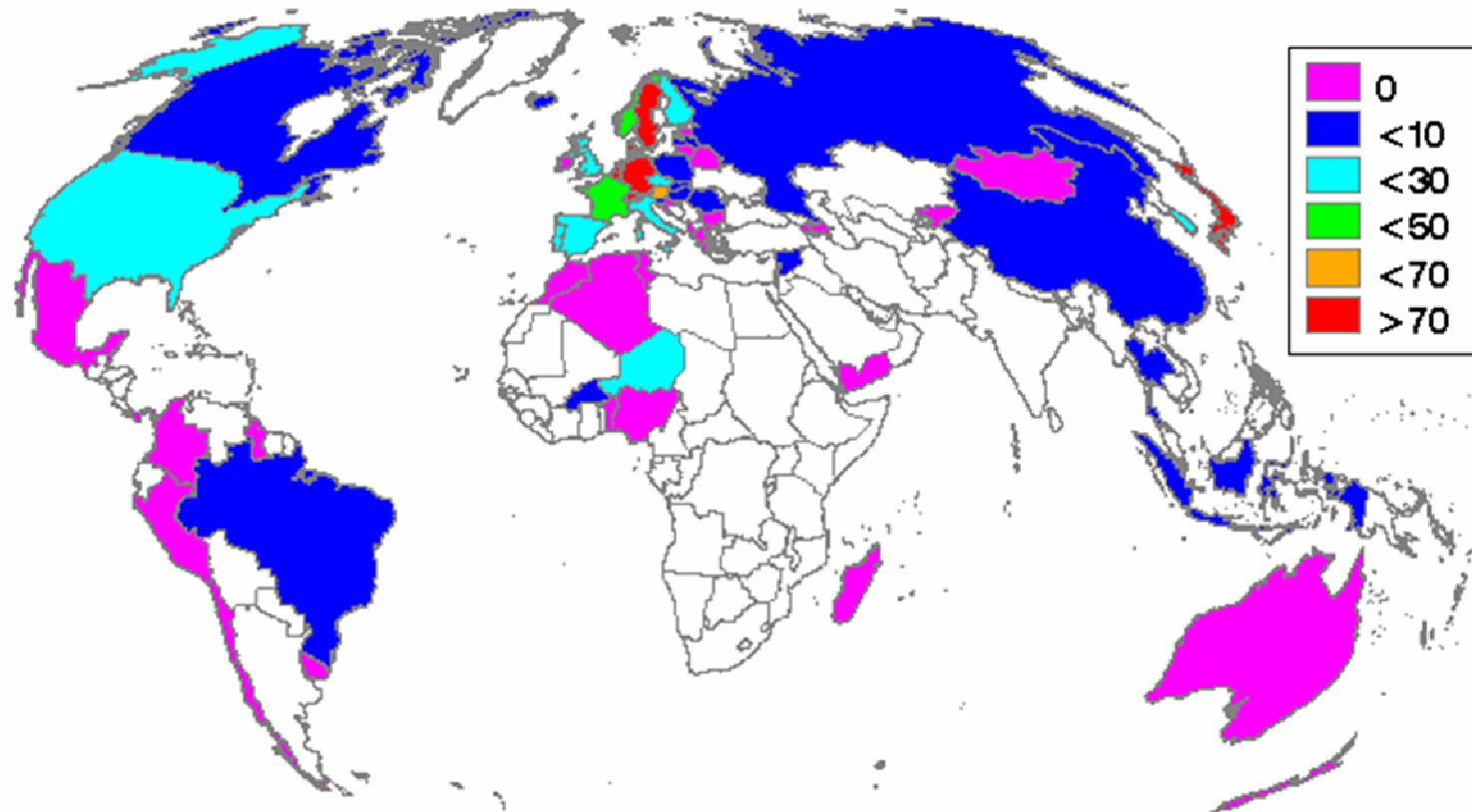


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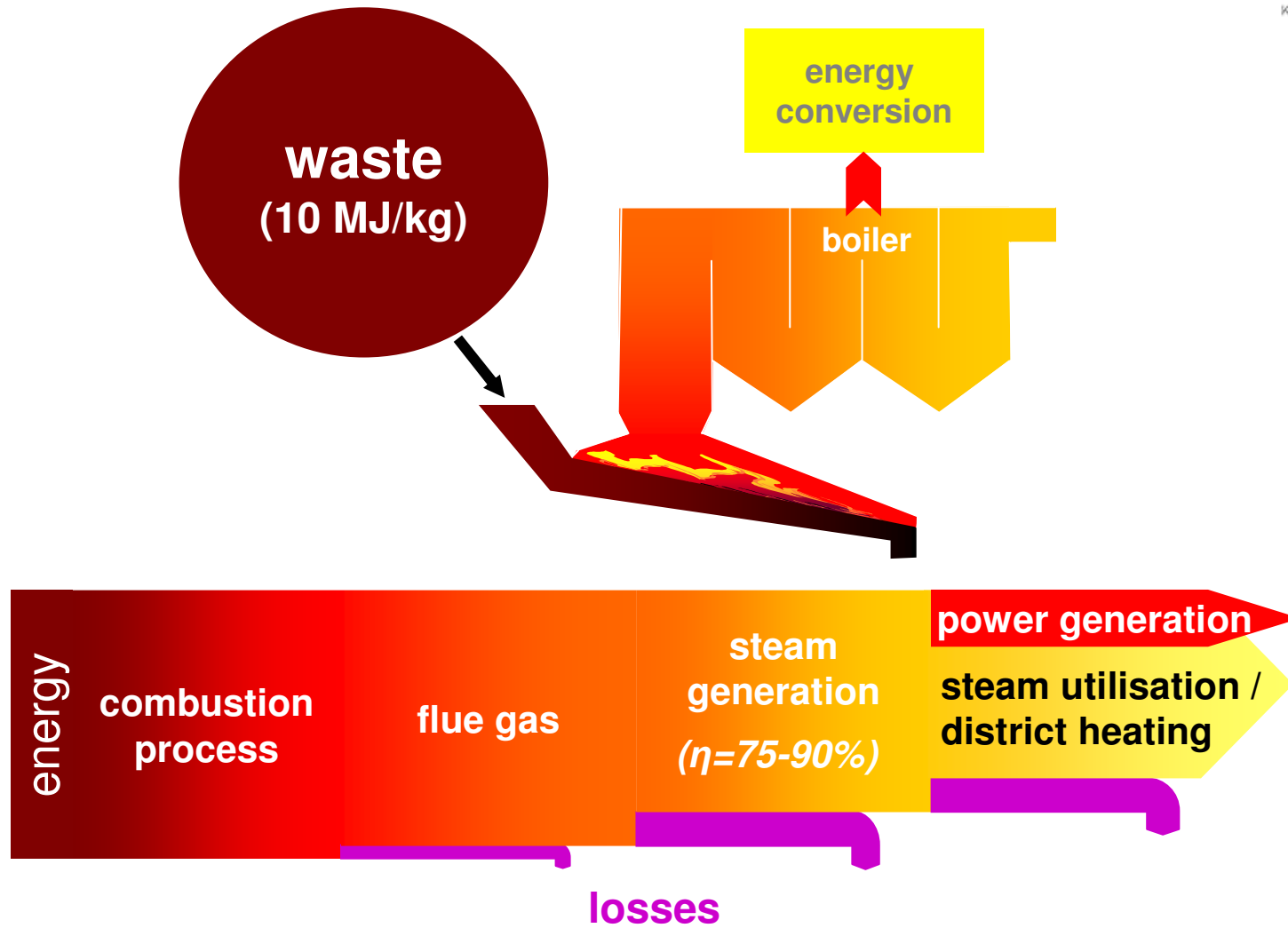


▼▼ America ■■ Asia ◆◆ Australia ●● Europe

biogenic energy fraction in MSW in %



incineration of residual MSW in %



energy flow in a waste incinerator



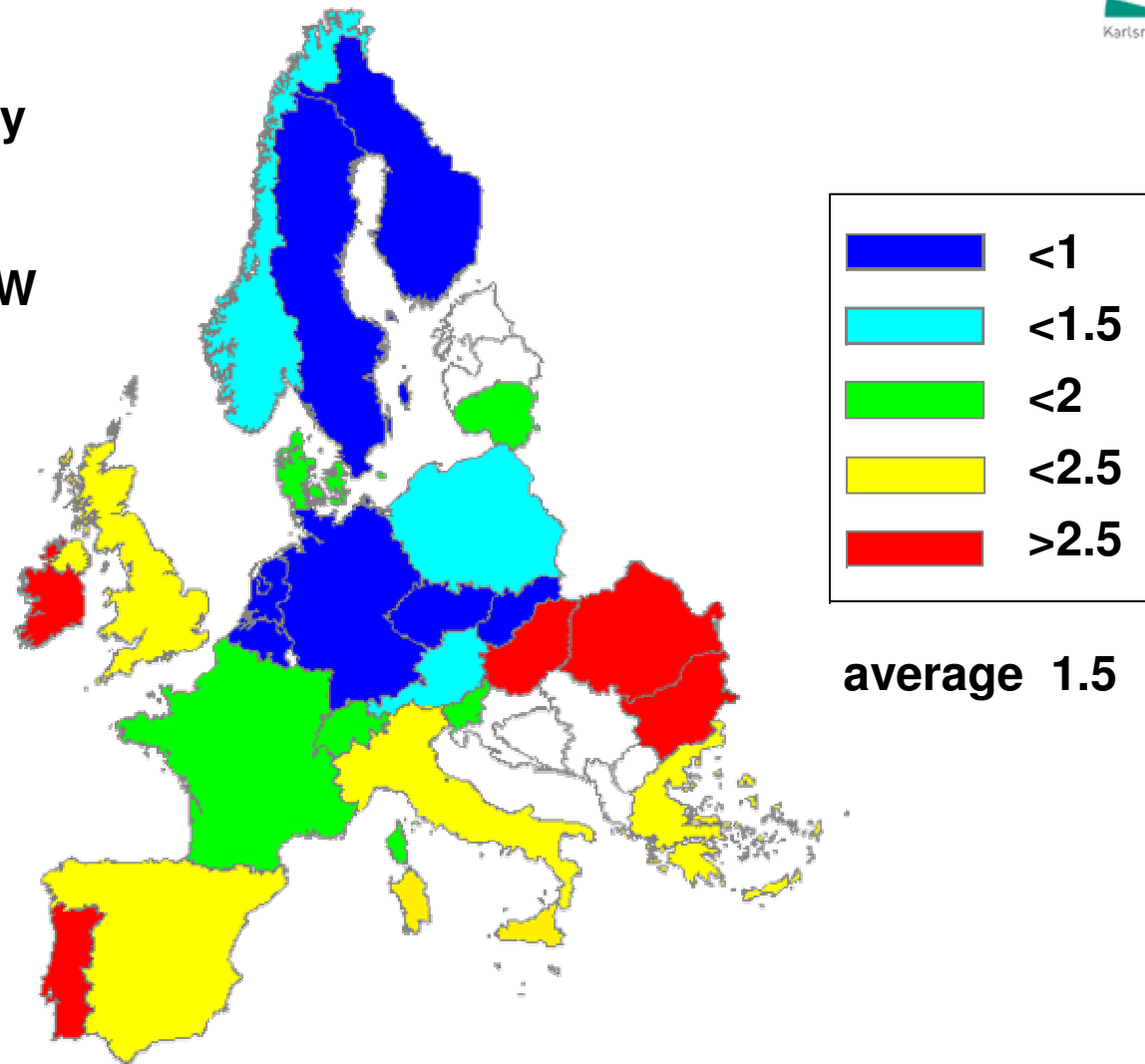
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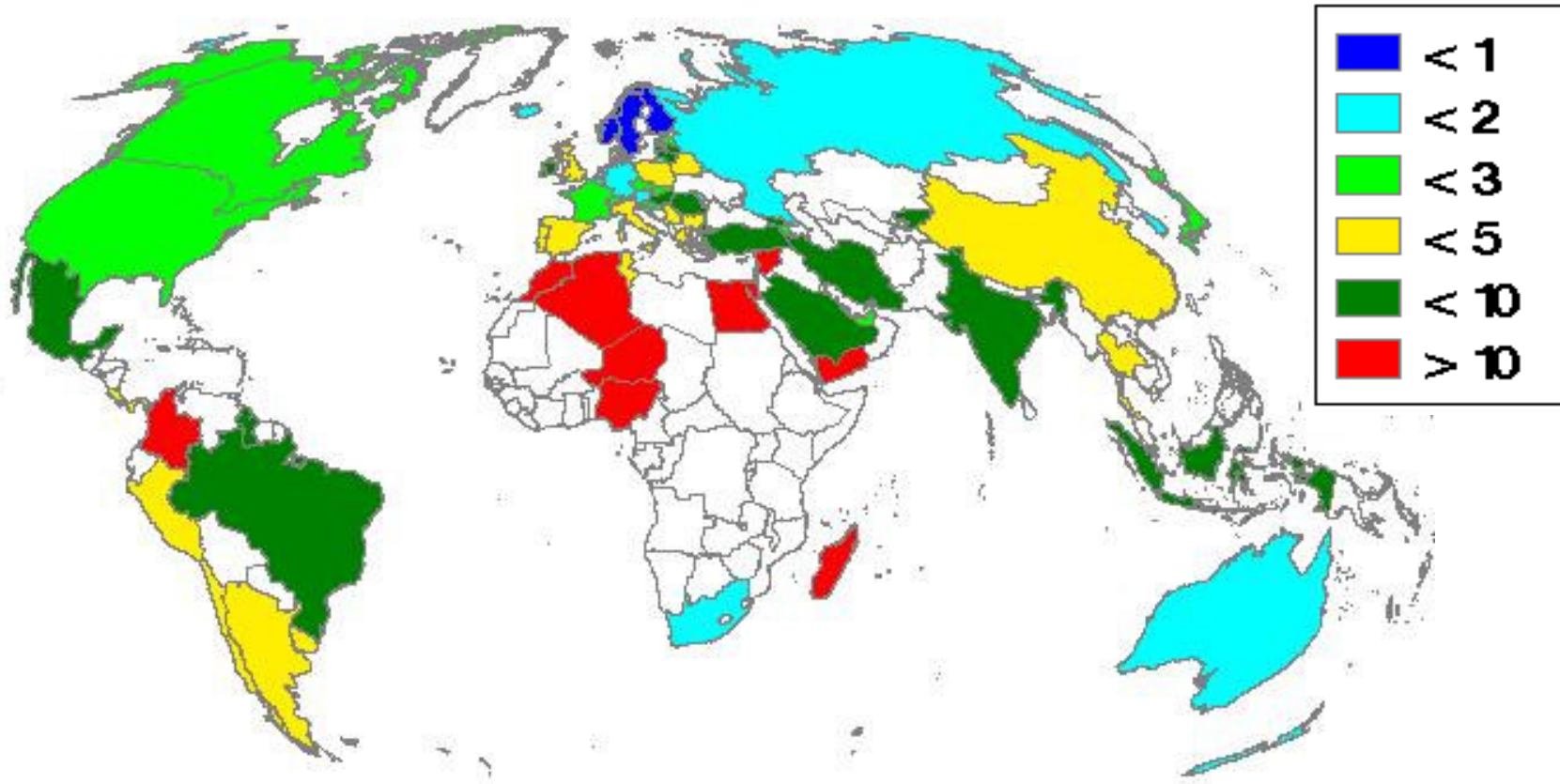
primary energy
79 500 PJ

2006 from MSW
230 PJ

potential
1 065 PJ



potential primary energy supply by MSW in EU (%)



potential of MSW for power supply in %



conclusions

- waste incineration with energy recovery is a suited method for MSW inertisation prior to final disposal
- generation and heating value of MSW are correlated with the economic power of a country
- LHV in industrialised countries 8 – 11 MJ/kg
- MSW can supply of 1 – 2 % of primary energy or
- 2 - 4 % of power demand
- 50 – 70 % of the energy inventory of MSW are biogenic
- the respective CO₂ emission is climate neutral
- **energy recovery as by-product of waste incineration is a small but constant bioenergy source and should hence be exploited as far as possible**

outlook

- countries exploiting energy from waste will see this becoming one of the fastest growing bioenergy sectors in near future



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contacts

Juergen Vehlow

vehlow@itc-tab.fzk.de

**EU Network of Excellence
'Overcoming Barriers to Bioenergy'**

www.bioenergy-noe.org