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SMR 1585 - 2

WORKSHOP ON DESIGNING SUSTAINABLE ENERGY SYSTEMS
18 October - 5 November 2004

REPRESENTATION OF DIFFERENT ENERGY TECHNOLOGIES IN MESSAGE

Arvydas GALINIS
Lithuanian Energy Institute, Laboratory of Basic Energy Research
LT-44403 Kaunas 36
Lithuania

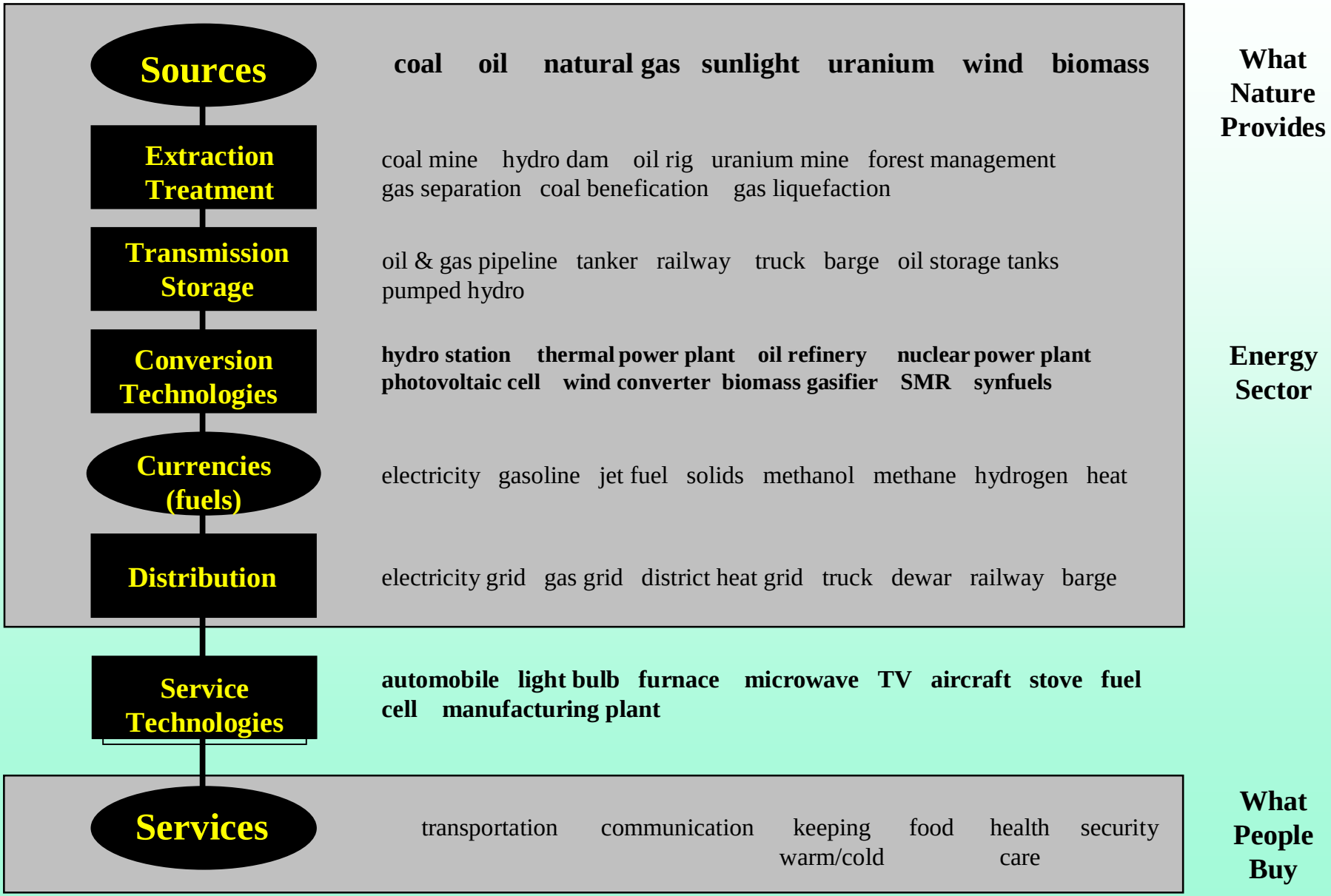
These are preliminary lecture notes, intended only for distribution to participants.

strada costiera, 11 - 34014 trieste italy - tel. +39 040 2240111 fax +39 040 224163 - sci_info@ictp.trieste.it - www.ictp.trieste.it

Representation of different energy technologies in MESSAGE

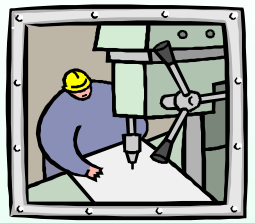
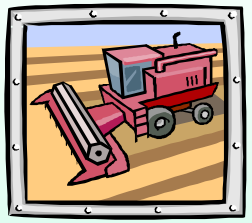
A.Galinis

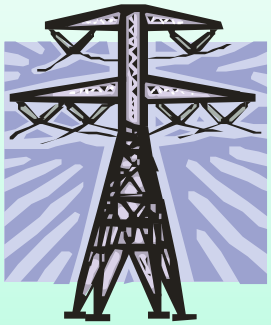
Research area



Energy Technologies









Technologies in fuel supply sector

Fuel extraction (coal mines, oil-wells);

Fuel cleaning (coal washing);

Fuel enrichment (enrichment of nuclear fuel);

Fuel fabrication (nuclear fuel; peat briquettes);

Fuel conversion (refineries, conversion of spend nuclear fuel into nuclear fuel);

Fuel transportation (by road, railway, ships, pipes);

Fuel distribution (by road, pipes);

Fuel import (oil terminals, coal terminals);

Fuel export (oil terminals, coal terminals);

Technologies in energy production sector

Power plants (oil, coal, nuclear, hydro)

Boiler-houses;

Refineries;

Electricity transmission and distribution networks;

Heat transmission and distribution networks;

Flue gas cleaning equipments;

End use technologies

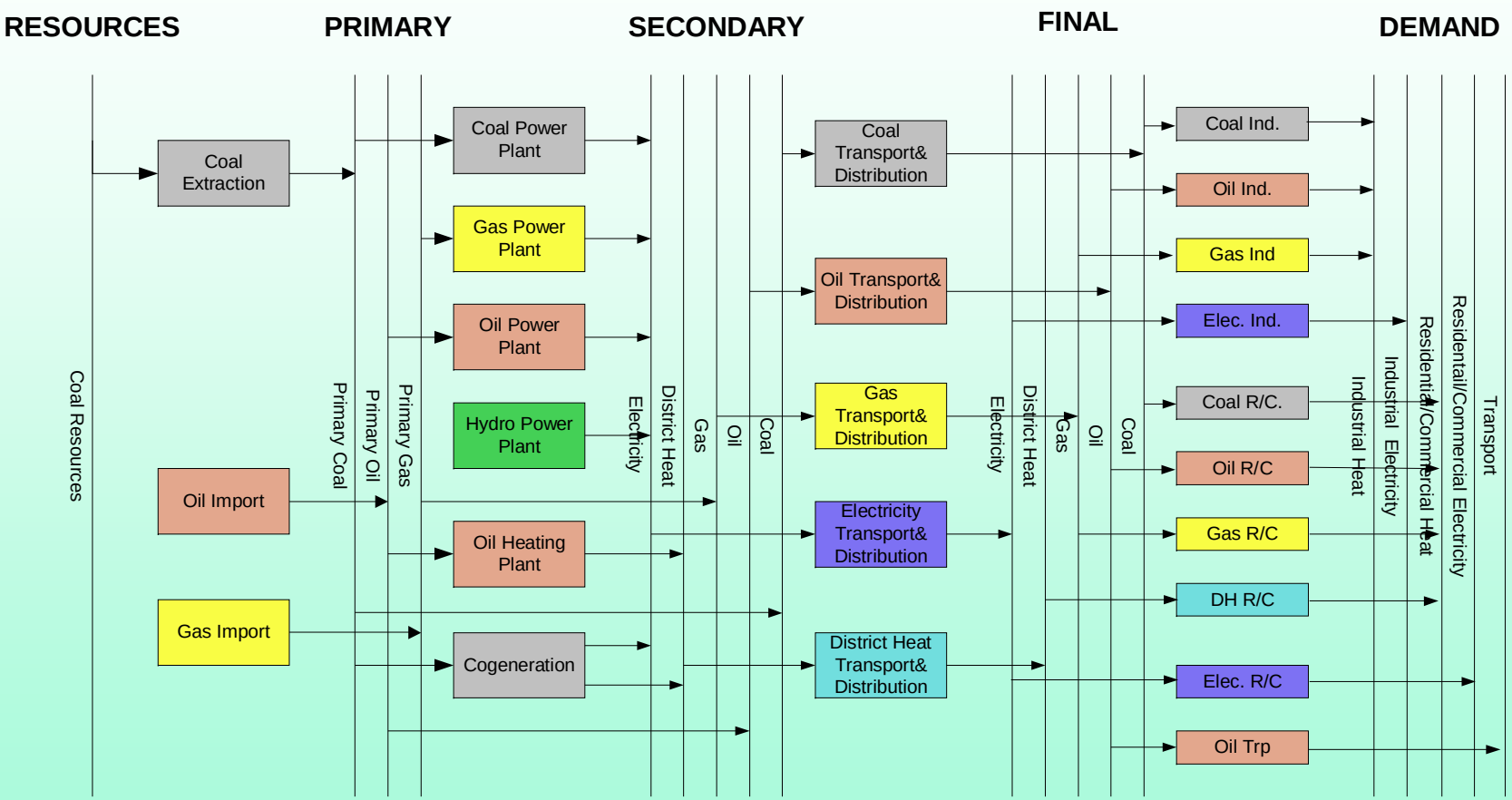
Technological lines of various industries;

Variuos houshalt devices;

Agricultural machines;

Transportation means;

Representation of technologies in energy flow network



Energy technologies in MESSAGE term (1)

Technologies having no input;

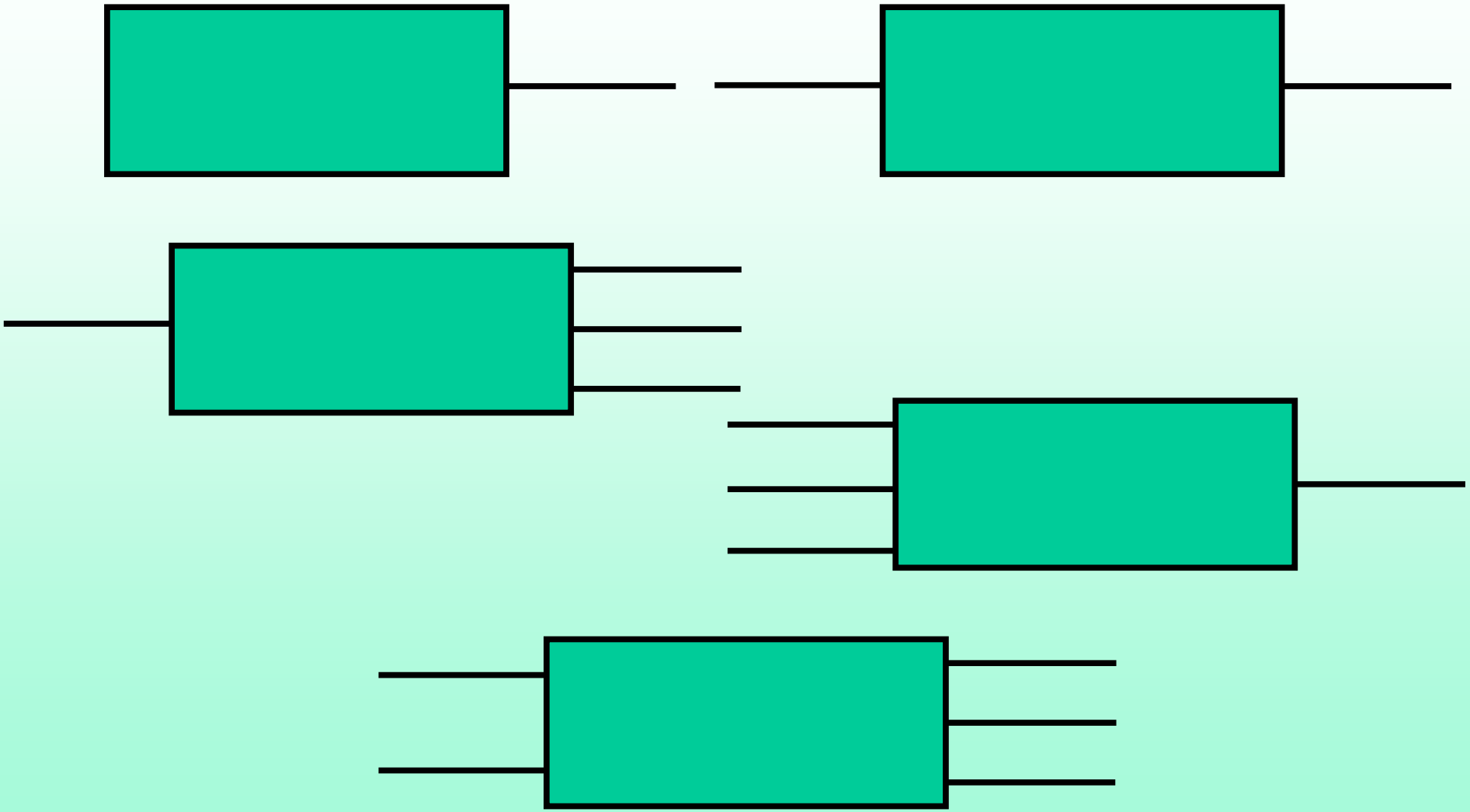
Technologies having single input and output;

Technologies having single input and multiple outputs (with fixed or free energy shares);

Technologies having multiple input and single outputs (with fixed or free energy shares);

Technologies having multiple input and multiple outputs (with fixed or free energy shares);

Energy technologies in MESSAGE term (2)



Peculiarities of technologies (1)

- **Seasonal variation**
- **Water inflows**
- **Mandatory releases**
- **Storage capacity**

- **Probabilistic availability**
- **Can be linked with storage or back-up systems**

Peculiarities of technologies (2)

- **Multiple inputs and outputs**
- **Fixed or flexible proportion of fuel inputs or energy outputs**
- **Seasonal limits on fuel use**
- **Efficiency may vary with fuel**
- **Emissions dependent on fuel use**
- **Environmental regulation**

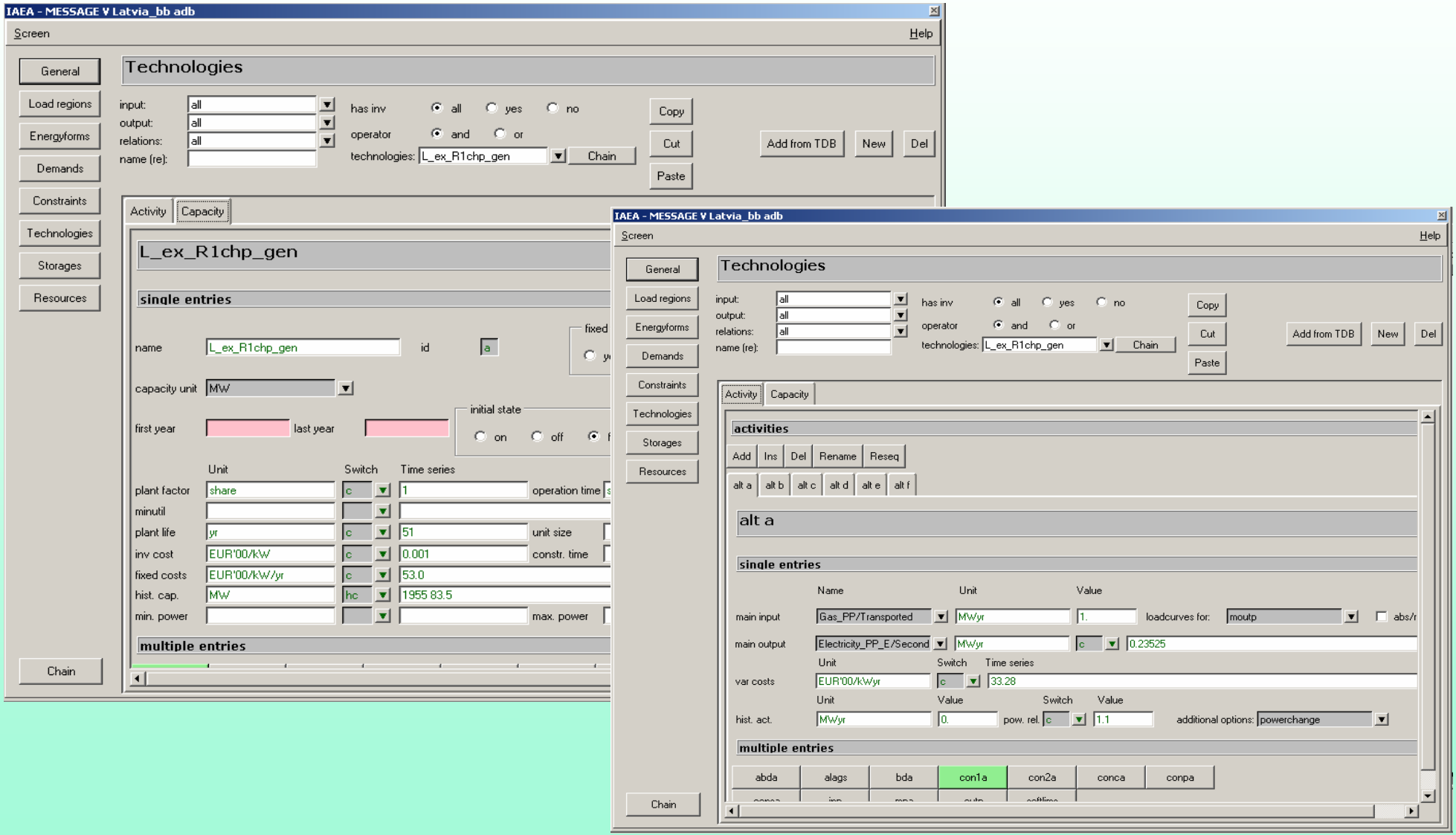
Peculiarities of technologies (3)

- Seasonal variation in capability
- Limits on production or fuel input
- Efficiency varying with time
- Costs varying with time

Capacity constraints

- Market penetration

Data entries for energy technologies in MESSAGE (1)



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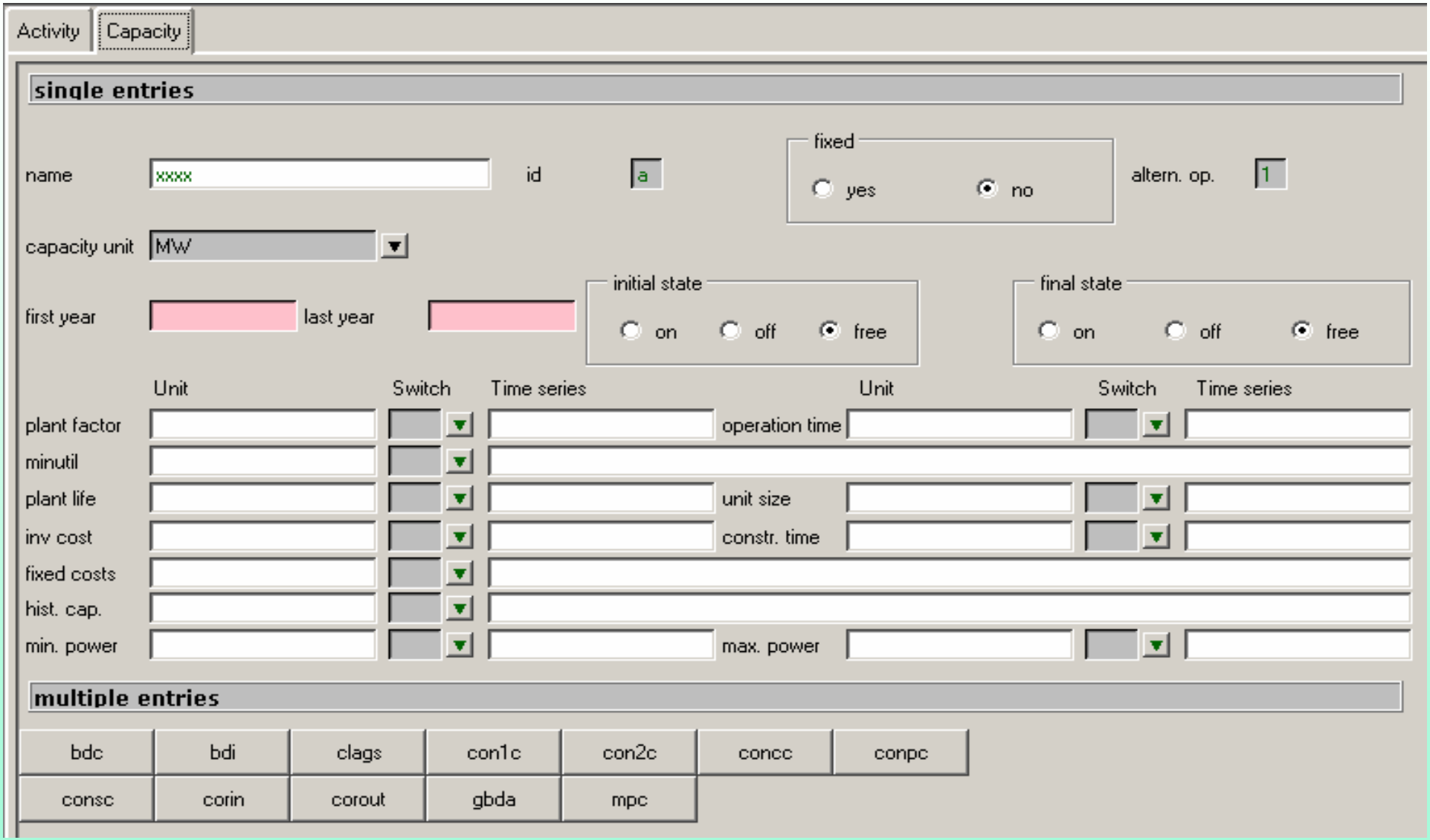

Data entries for energy technologies in MESSAGE (3)