

IPHE
Implementation-Liaison Committee

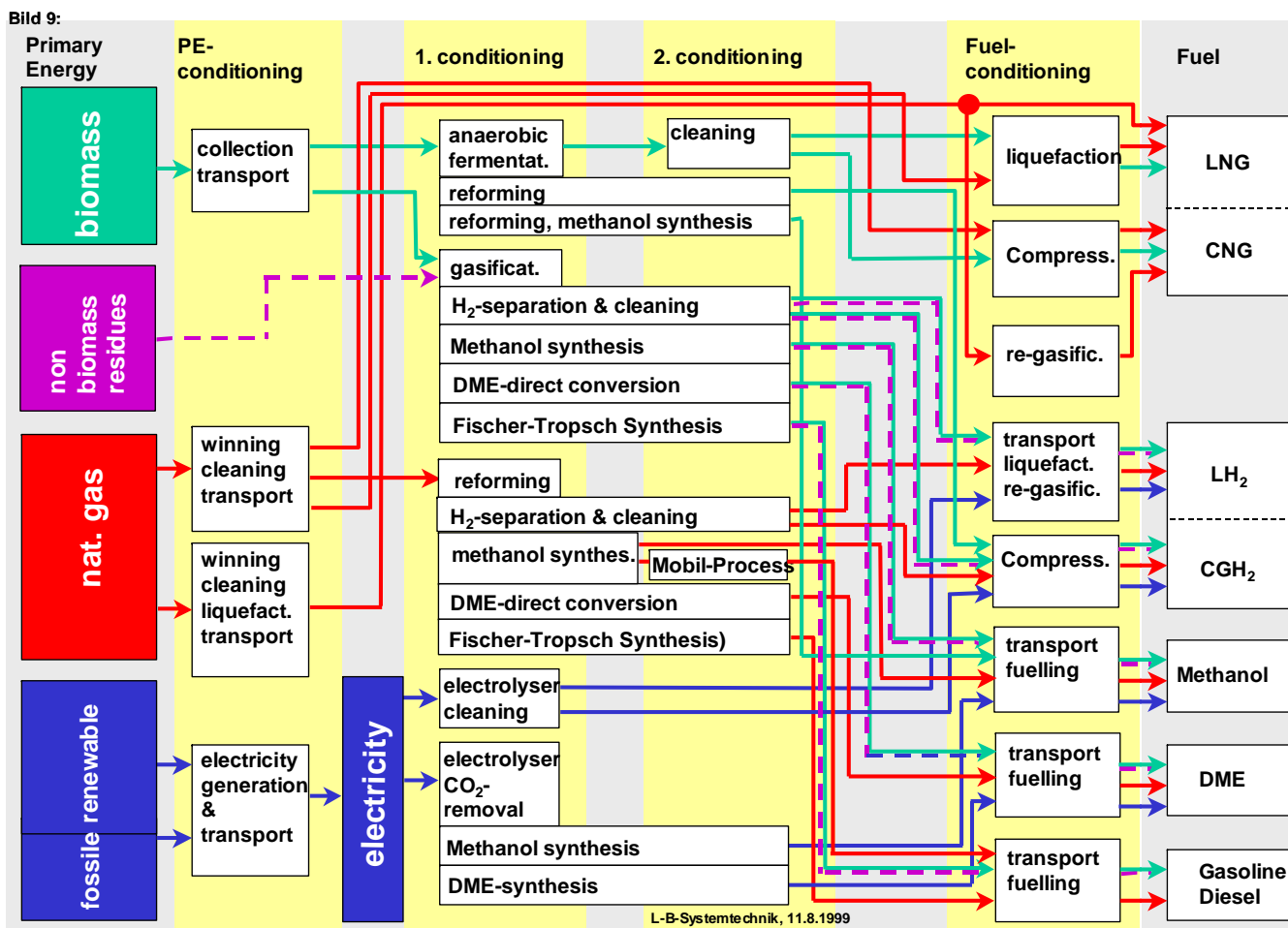
Socio-economics of Hydrogen

Hydrogen energy chains evaluation

- **Evaluation criteria**
 - **Efficiency**
 - **Cost (direct and indirect)**
 - **GHG emissions**
 - **Energy security of supply**
 - **Local environmental impacts**
 - **Impact on socio-economic criteria : employment, trade...**
 - **Safety, drivers of public acceptability**
- **Energy chains segments taken into account**
Hydrogen production, storage, transport, infrastructure, transport and stationary application.

Hydrogen energy chains (example)

Source : Holger Braess, BMW, Germany



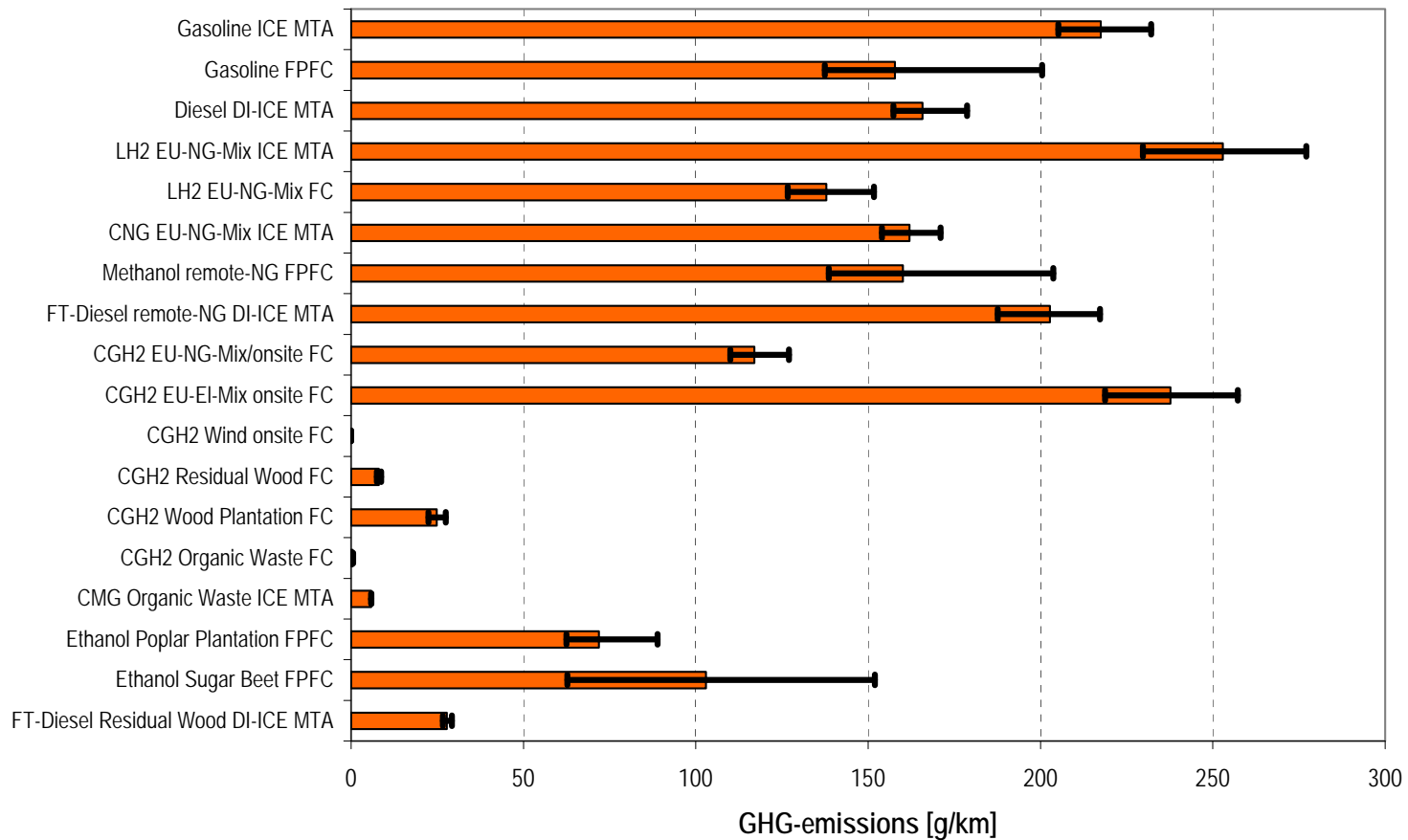
Identification and description of relevant energy chains

- **Identify the different relevant hydrogen energy chains to be evaluated and describe the technological segments**
- **Identify the reference (existing) or alternative (future) solutions which compete for the same application in order to assess hydrogen energy chain vs concurrent ones**
- **Pragmatic approach : considering at a first step a limited number of applications and hydrogen production processes and describing each elemental node**
- ***Proposed agenda : identification and description of relevant hydrogen chains taken into account by mid 2004***

Elaboration of a meta-database

- **Different databases exist, sometimes with different estimations**
- **Data include efficiency of different production and conversion processes, different storage and utilization technologies, costs (investments and operating costs), GHG emissions factors, other pollutants... (comparison well to wheel of energy chains)**
- **These data could refer to the present state of the art or rely on prospective assumptions to 2010, 2020, 2050...**
- **A meta-database should allow to share methodologies of costs and socio-economics impacts evaluation and ensure transparency**
- **Local specific indicators to be identified (emerging countries)**
- **A decision Aiding Tool E3 is being developed**
- *Proposed agenda : first compilation of existing databases produced by mid 2004 (expert group). A tentative meta-database scheme for end 2004*

Well to wheel GHG emissions for different hydrogen energy chains (example)



Hydrogen energy scenarios elaboration

- **Quantitative scenarios development in order to assess the possible trajectories of technologies implementation**
- **Scenarios should take into account the present value of technico-economic parameters of each hydrogen chain and their prospective evolution respectively to concurrent solutions and delay of market penetration (see the work done by IEA on market transformation policies evaluation)**
- **Inquiry on existing hydrogen energy modeling scenarios and a comprehensive analysis of their output should be conducted and presented to ILC**
- **The Energy Technology Perspectives Model of IEA and its applications should be presented to ILC**
- *Proposed agenda : a workshop on hydrogen energy existing scenarios developed in the world organized end of 2004*

Sociological issues : drivers of acceptance

- **Analysis of stakeholders behaviour and strategies toward hydrogen energy technologies**
- **Analysis of acceptance conditions mainly through field experience studies (demonstration project...)**
- *Proposed agenda : identification of existing sociological studies conducted on demonstration projects for mid 2004*