

# Future Technology Perspectives

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Expert Workshop: Towards Further  
Collaboration between Japanese  
Research Community and IIASA

UNU, Tokyo, 30 January 2017

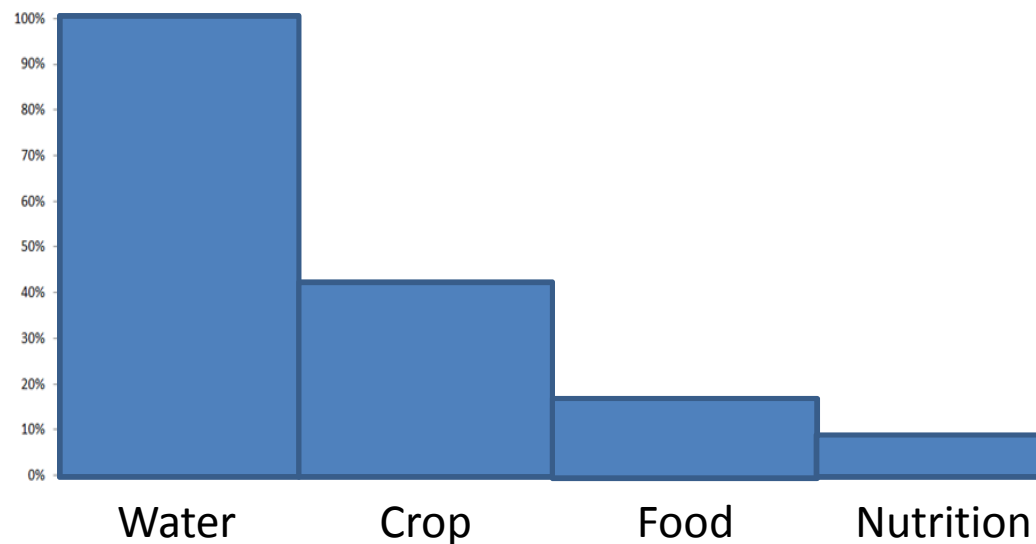
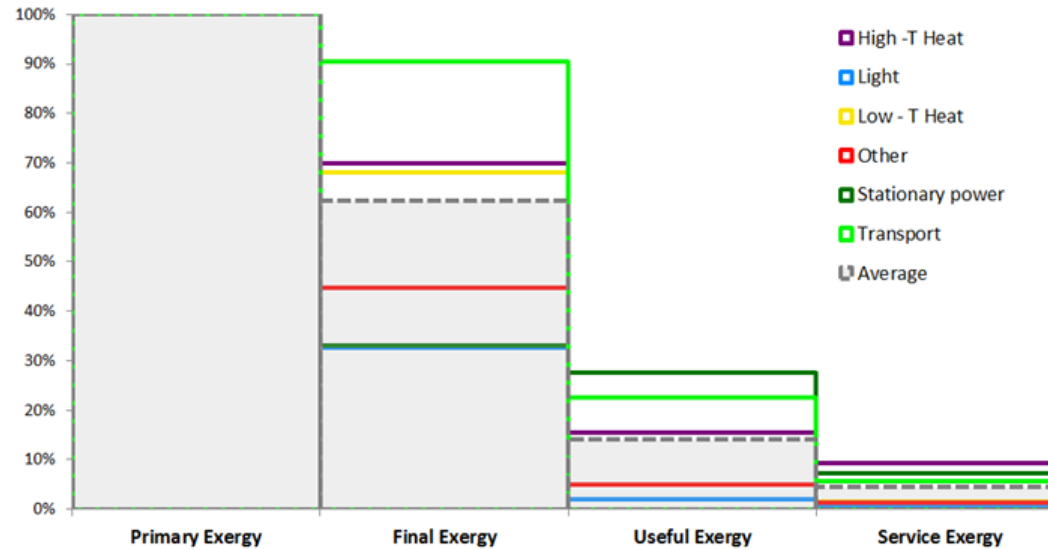


# New Technology Perspectives

- Integrated multi-dimensional perspectives: SDGs (TWI2050)-, Nexus-, Tech-Society-interactions (systems view)
- Technology: hardware + social organization
- Innovation: supply and demand
- Inter-sectorial and international spillovers
- Need for common concepts and metrics (“welfare”, efficiency, resilience, scalability)

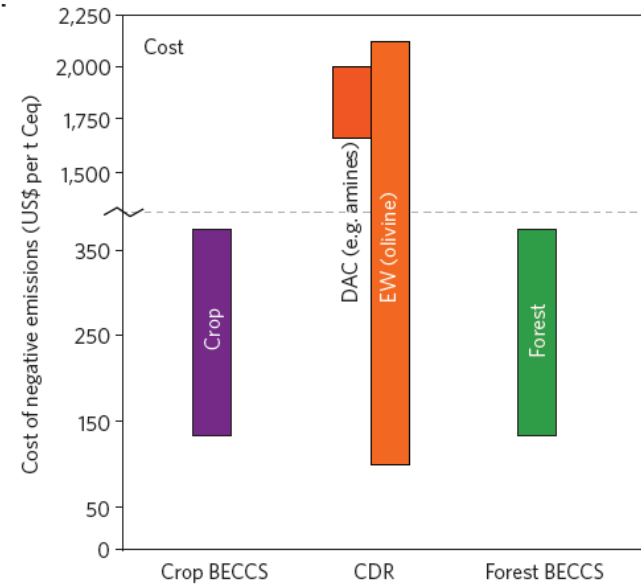
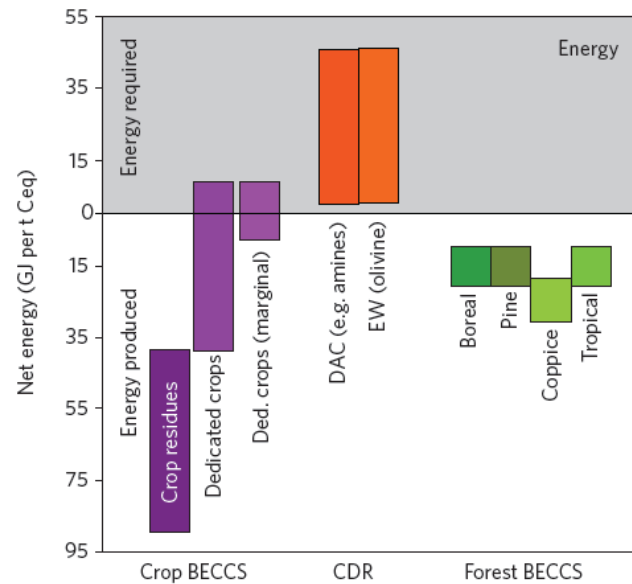
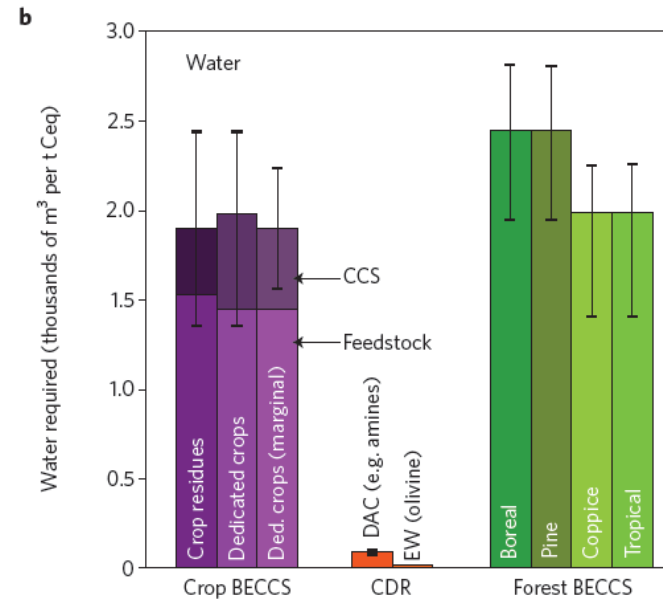
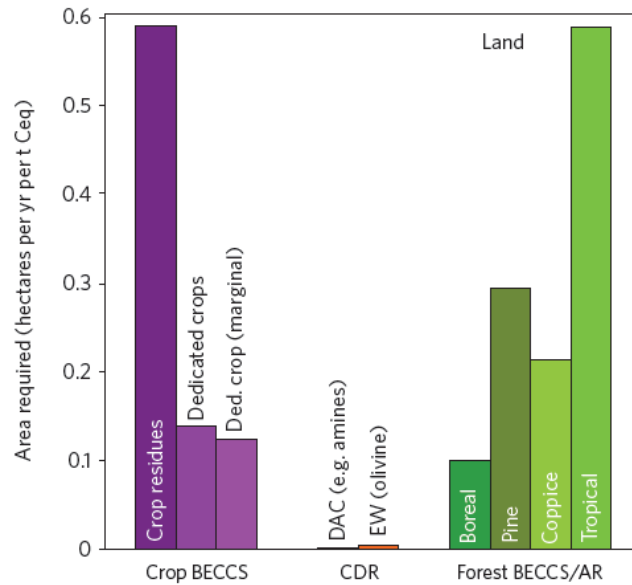
# Efficiency of Resource Use (Production AND Consumption): percent of primary input remaining at step of conversion/use chain

Example Energy (all uses, exergy efficiency)  
and Water (irrigated agriculture & food, water usage efficiency)



# Negative Emissions Technology Assessment

(Smith *et al.*, Nature CC, 2015)



# Explaining Fast vs. Slow Transitions

## slow transitions

systemic

novel concepts,  
formative phases

lumpy technologies  
& infrastructures

early adopting markets

weak adopter benefits  
(mainly less externalities)

co-ordination problems, vested  
interests

## fast transitions

discrete technologies

market-ready  
substitutes

granular technologies  
& social networks

late adopting markets

strong adopter benefits,  
high relative advantage

strong co-ordination  
and policy direction

# Key Novel Research Areas

## slow transitions

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**Emergent properties**

**& complexity**

**Scenarios**

**(alternative configurations)**

**Social “demands”**

**Role of institutions and policy learning**

