

Sustainable Biomass Utilization Scenario and Asian Biomass Strategy

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“Green Biomass
for Blue Earth”



Challenges in the 21st century

- 1) Energy
- 2) Environment
- 3) Food

Trilemma !

***Collaborations (Agriculture & Engineering etc.)
in the Asian Countries***

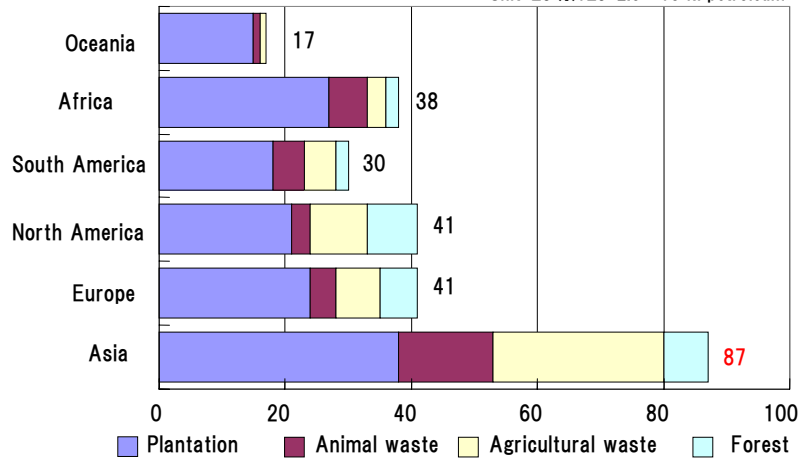
keyword: **Biomass**



Potential of biomass energy

Asian region has abundant biomass resources.
(87EJ corresponds to 2.3 billion kl-petroleum)

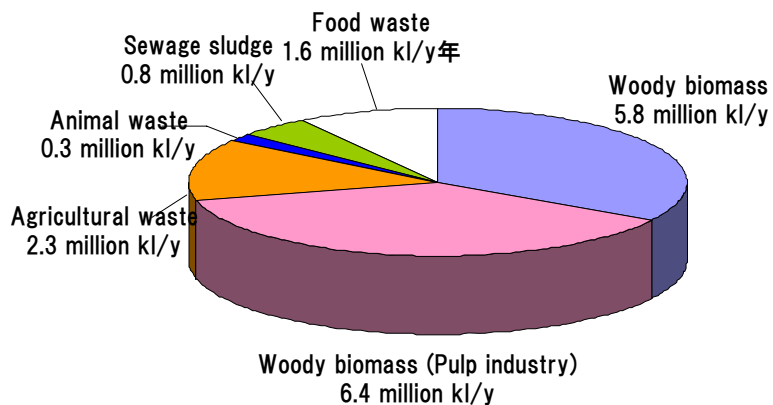
Unit: EJ ※1EJ=2.6×10⁷kl-petroleum



Ref. "Study on energy conversion technology for Biomass"
(RITE, 1998~2000)

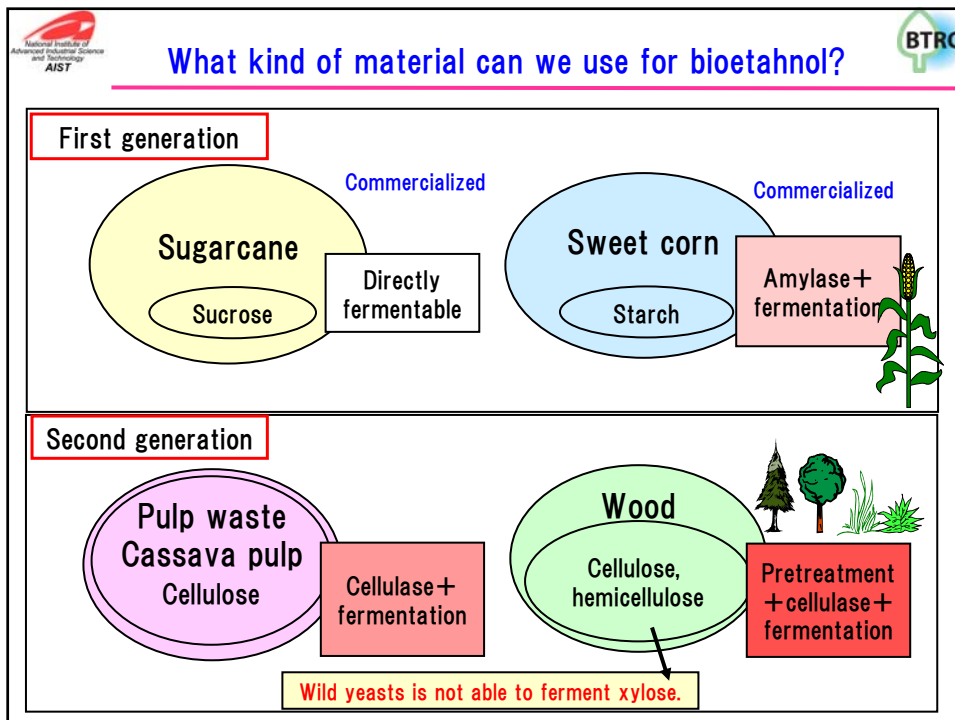
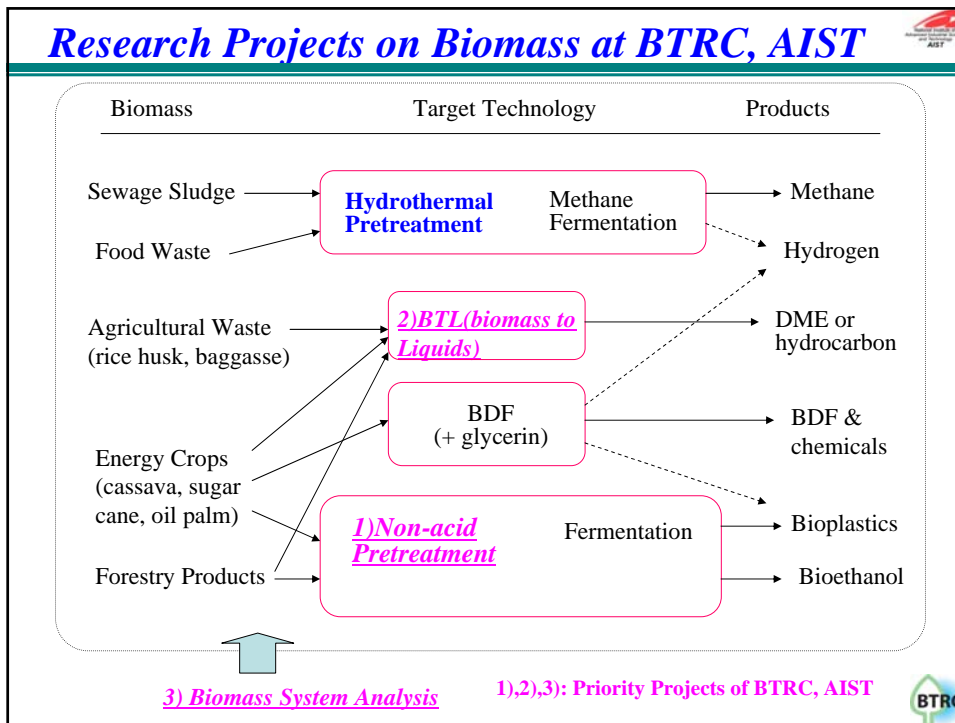
Potential of biomass utilization in Japan

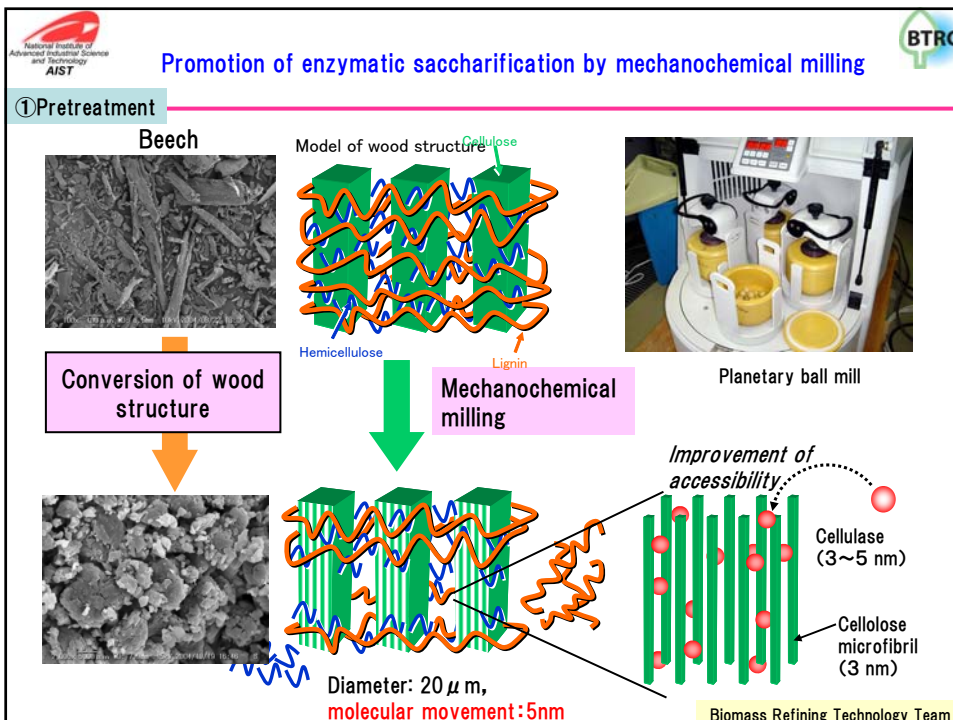
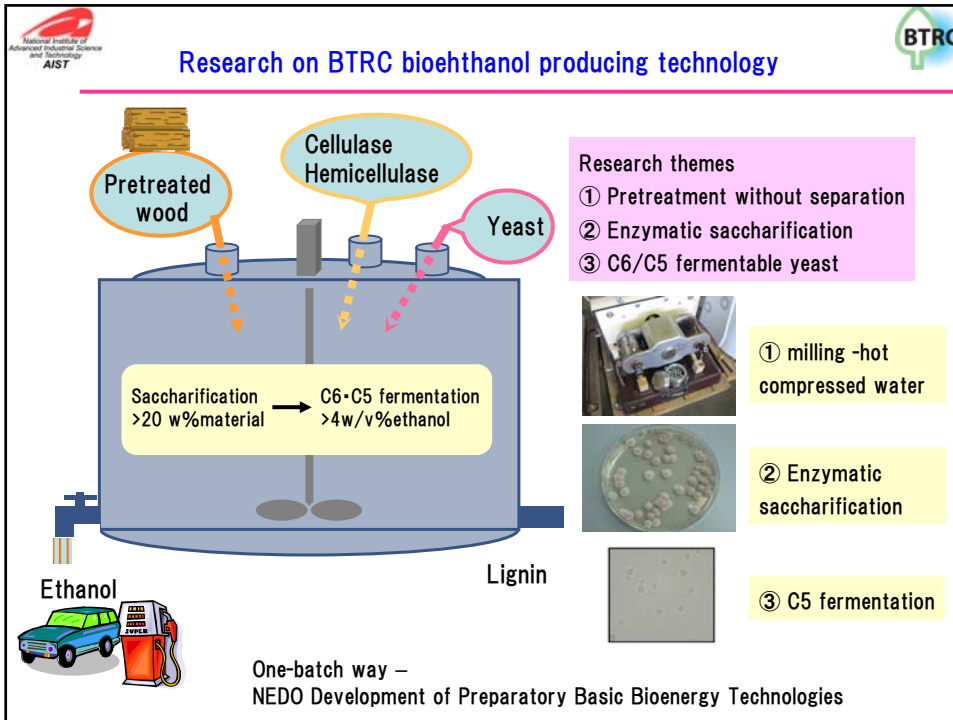
Total 17 million kl-petroleum

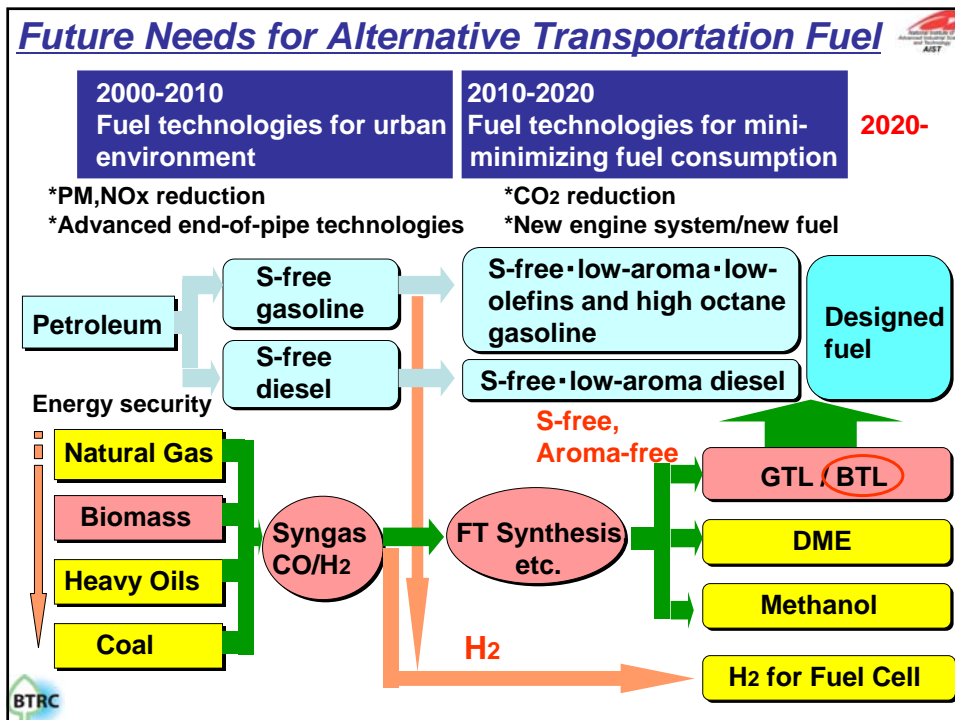
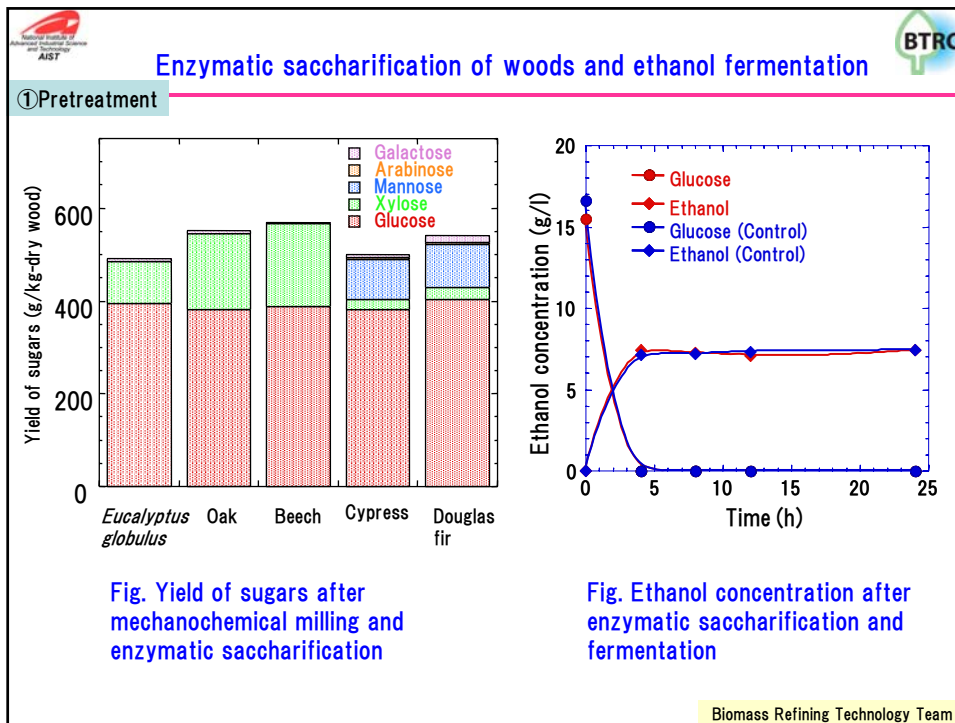


※ : 1PJ=10¹⁵ J=2.58万kl, 1EJ=10¹⁸J

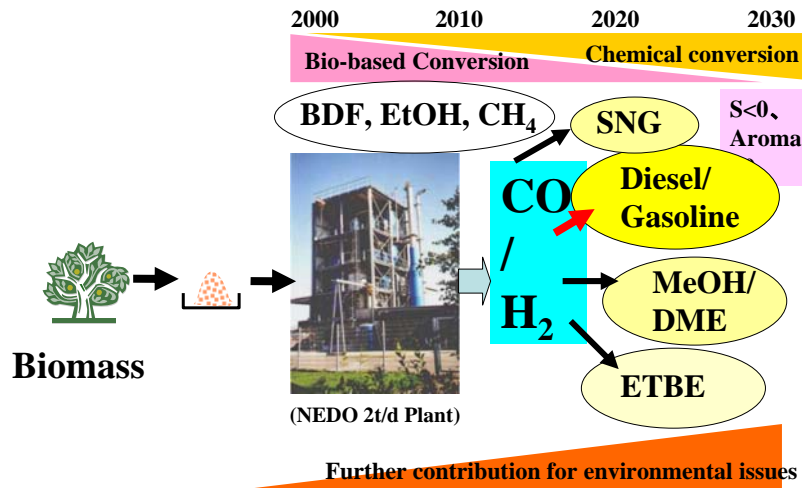
Ref: Basic study on promotion of new energy utilization, METI, 2002



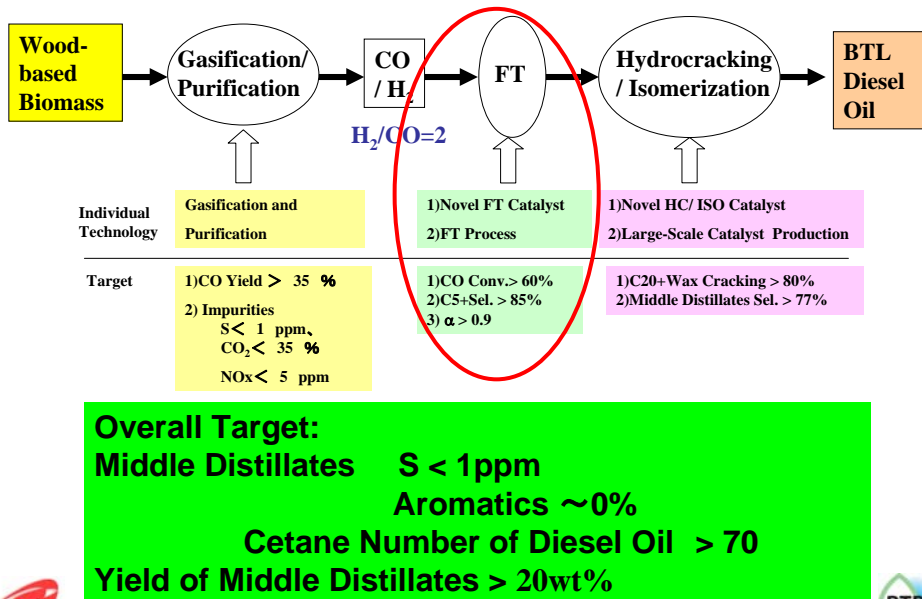




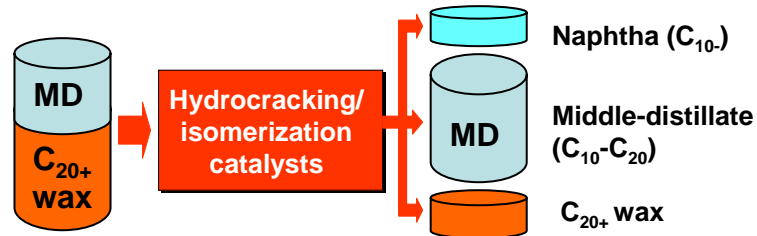
Road map of BTL development



AIST Process Development from Wood-based Biomass to Liquid



Research Target in Upgrading of Primary FT Products



Targets in C₂₀₊ wax upgrading:

- * conversion >80%
- * selectivity to MD >75%
- * iso-paraffins in MD >65%

Quality of MD:

- * Sulfur < 1ppm
- * Aromatics ~ 0
- * Cetane No. >70

R&D of hydrocracking/isomerization catalysts:

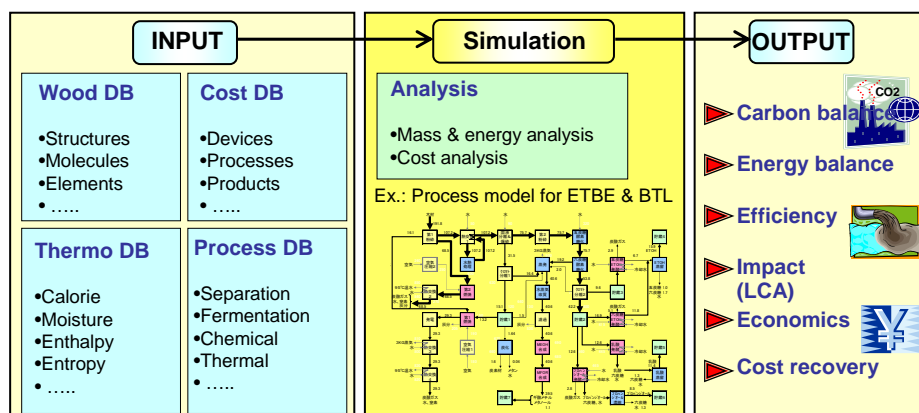
- *Solid catalyst preparation and in depth characterization of catalysts.
- *Hydrocarbon fuel analyses for elucidating the reaction mechanism.
- *High-pressure continuous flow reactors (micro, bench) operation.
- *Thermodynamic analyses for hydrocarbon reactions and for the catalysts deactivation

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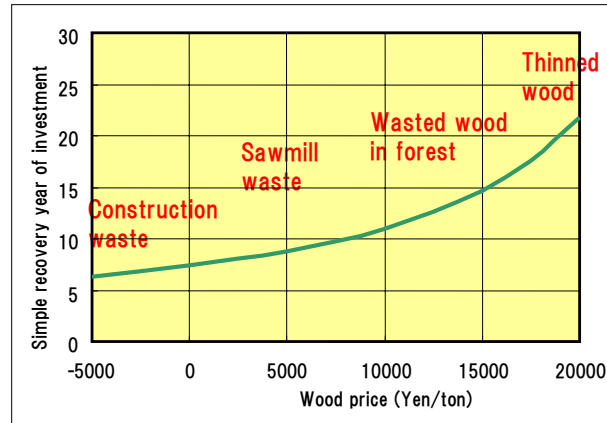
Biomass System Analysis and Simulation

Objectives:

1. To develop biomass system simulation technology, Ground database (DB) should be constructed.
 2. To design economic feasible total system for biomass.
- The simulator can be used for optimization, economic & environmental analysis.



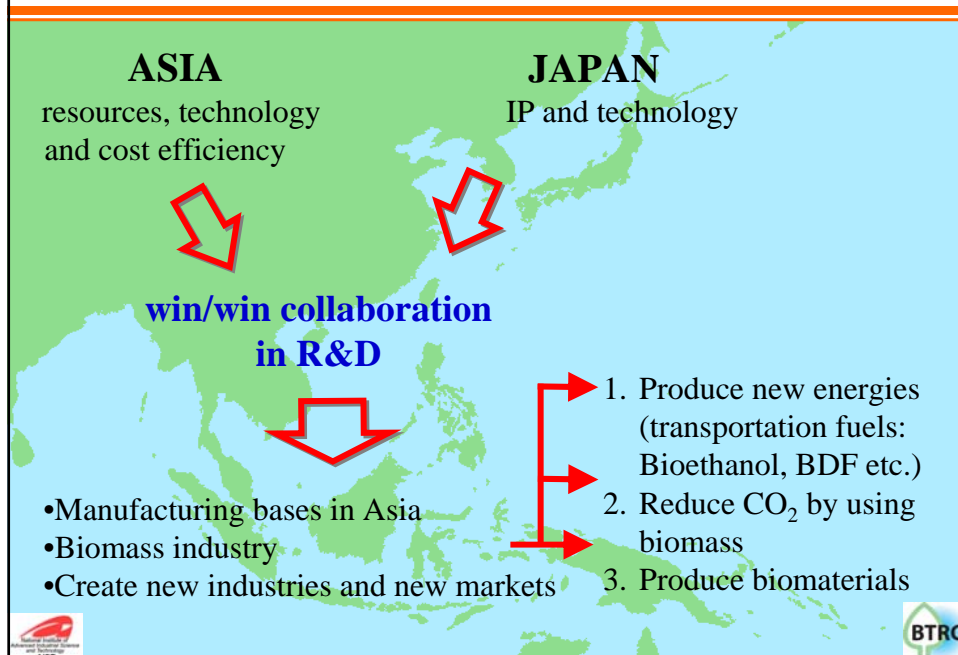
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Simple recovery year of investment = Total investment
(Construction cost: 27 billion yen) / Annual withdrawal

Annual withdrawal = Ethanol sales (60 yen/l) - Operational cost

Biomass-Asia Strategy--- for Sustainable Growth



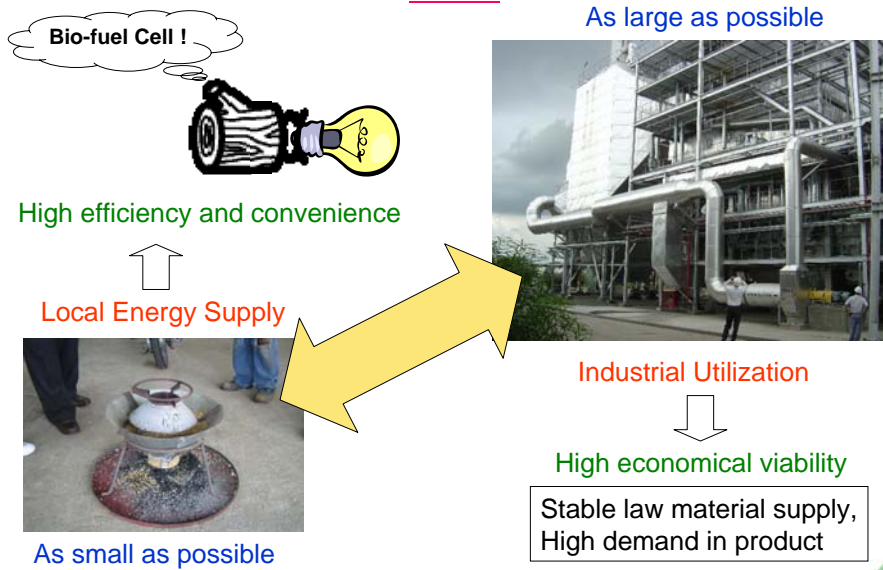
Estimated Biomass Yields as Main Product and Residues

(million tons)

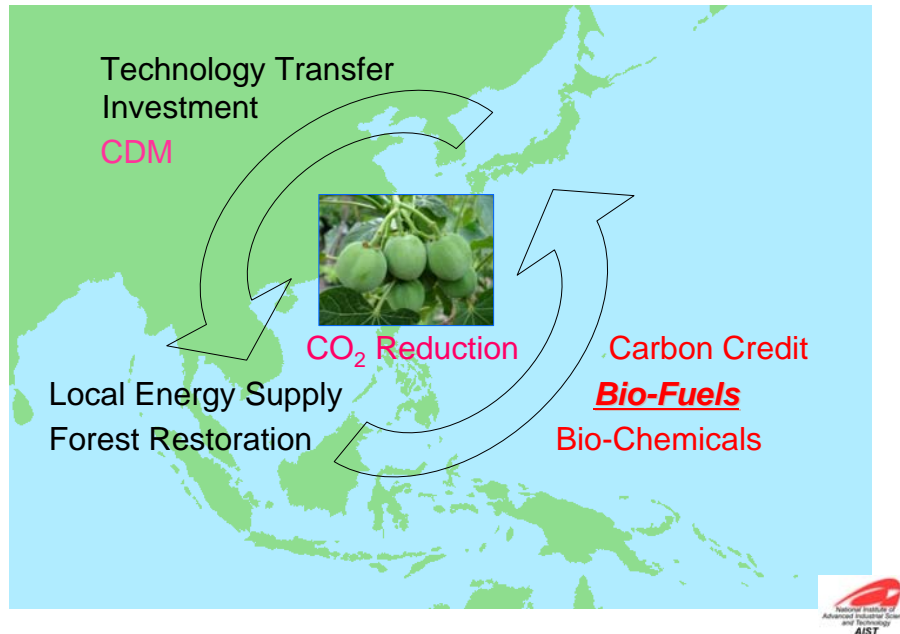
Crops	Biomass	Thai-Land	Vietnam	Indonesia	Malaysia	Philippines
Oil Palm (Coconut Palm)	Main Product 33	1		13 (1)	16	(2)
	Factory Residue 38	1 (1)		10 (8)	11	(7)
	Field Residue 71	2 (1)		26 (6)	31	(5)
Sugar-cane	Main Product 15	7	2	3		3
	Factory Residue 44	21	6	8		9
	Field Residue 32	19	5	8		8
Cassava	Main Product 11	5	1	5		
	Factory Residue 14	6	2	6		
	Field Residue 20	9	2	9		
Rice	Main Product 74	15	20	31		8
	Factory Residue 34	7	9	14		4
	Field Residue 84	17	23	35		9
Timber (Wasted Trunk)	Main Product 18	2	1	8	6	1
	Factory Residue 18	2	1	8	6	1
	Field Residue 32	1 (1)	1	6 (9)	4 (7)	(3)

for 2003 or 2004

Two Typical Biomass Utilization Models in Asia



Fruitful Collaborations Using Biomass



Sustainable Biomass Utilization Scenario in Asia



1) Palm Oil and Energy Complex ;

- Combined production of BDF and other bio-fuels for sustainable availability and environmental protection

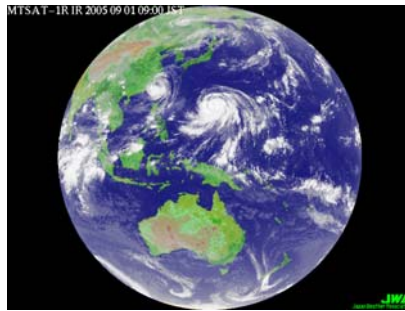
2) Sugar and Rice Energy Complex;

- Large-scale bio-ethanol production from agricultural wastes for simultaneous supply of food and bio-fuels

3) Wood Refinery Complex;

- Total multi-production system of timber, paper pulp, ethanol, and chemicals for new business model





“Green Biomass for Cool Earth”

*Thank you for your
attention!*

