



Technology Transfer & Commercialization – Private Sector Perspective

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McKinsey & Company
McKinsey Global Institute

12 Disruptive Technologies

Renewable energy

- 21,000 TWh annual global electricity consumption
- Renewable energy is expected to account for 20% of global electricity generation by 2030
- Renewable energy is expected to account for 30% of global electricity generation by 2050
- Renewable energy is expected to account for 40% of global electricity generation by 2070
- Renewable energy is expected to account for 50% of global electricity generation by 2090

Advanced oil & gas exploration & recovery

- Advanced oil & gas exploration & recovery is expected to account for 10% of global oil production by 2030
- Advanced oil & gas exploration & recovery is expected to account for 15% of global oil production by 2050
- Advanced oil & gas exploration & recovery is expected to account for 20% of global oil production by 2070
- Advanced oil & gas exploration & recovery is expected to account for 25% of global oil production by 2090

Advanced materials

- Advanced materials is expected to account for 10% of global GDP by 2030
- Advanced materials is expected to account for 15% of global GDP by 2050
- Advanced materials is expected to account for 20% of global GDP by 2070
- Advanced materials is expected to account for 25% of global GDP by 2090

3D printing

- 3D printing is expected to account for 10% of global GDP by 2030
- 3D printing is expected to account for 15% of global GDP by 2050
- 3D printing is expected to account for 20% of global GDP by 2070
- 3D printing is expected to account for 25% of global GDP by 2090

Energy storage

- Energy storage is expected to account for 10% of global GDP by 2030
- Energy storage is expected to account for 15% of global GDP by 2050
- Energy storage is expected to account for 20% of global GDP by 2070
- Energy storage is expected to account for 25% of global GDP by 2090

Next-generation genomics

- Next-generation genomics is expected to account for 10% of global GDP by 2030
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- Next-generation genomics is expected to account for 20% of global GDP by 2070
- Next-generation genomics is expected to account for 25% of global GDP by 2090

Mobile Internet

- Mobile Internet is expected to account for 10% of global GDP by 2030
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- Mobile Internet is expected to account for 25% of global GDP by 2090

Automation of knowledge work

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Internet of Things

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Cloud technology

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Advanced robotics

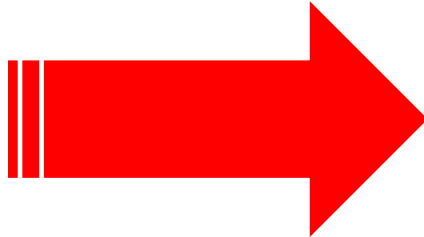
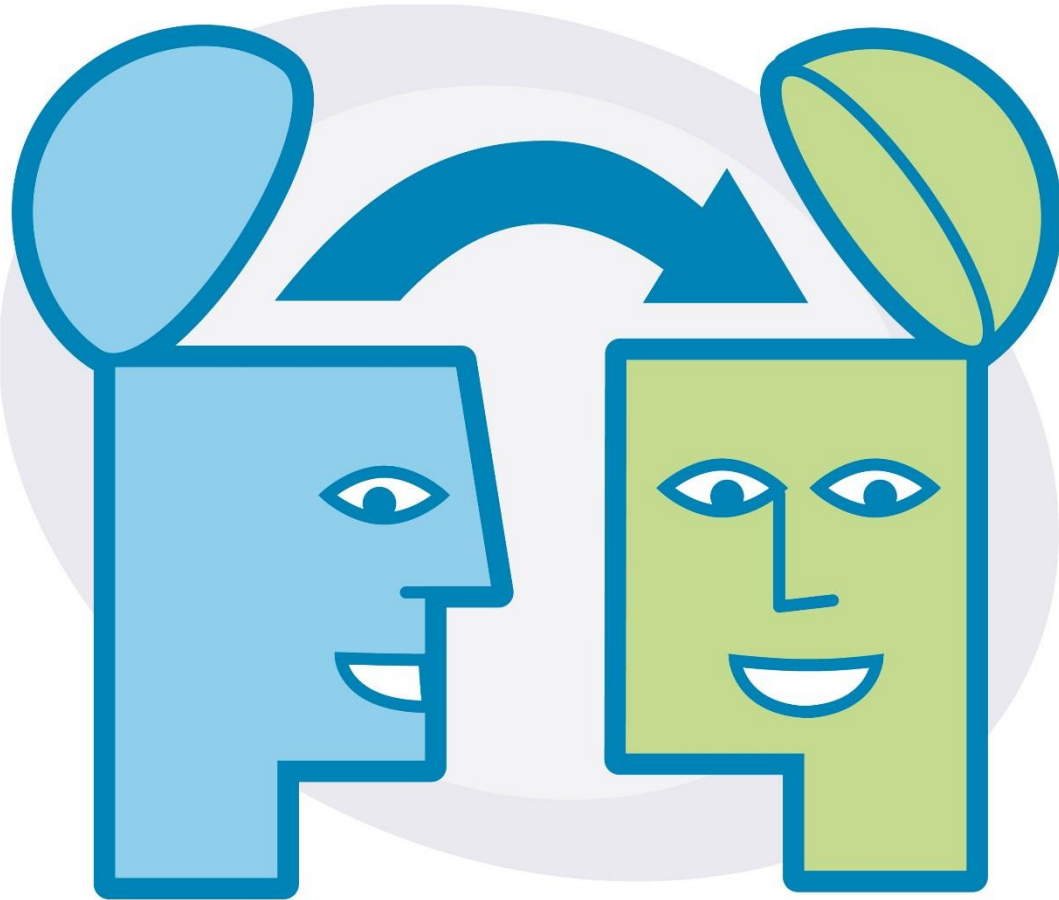
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Autonomous and near-autonomous vehicles

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Technology Transfer in Business View



Technology Transfer

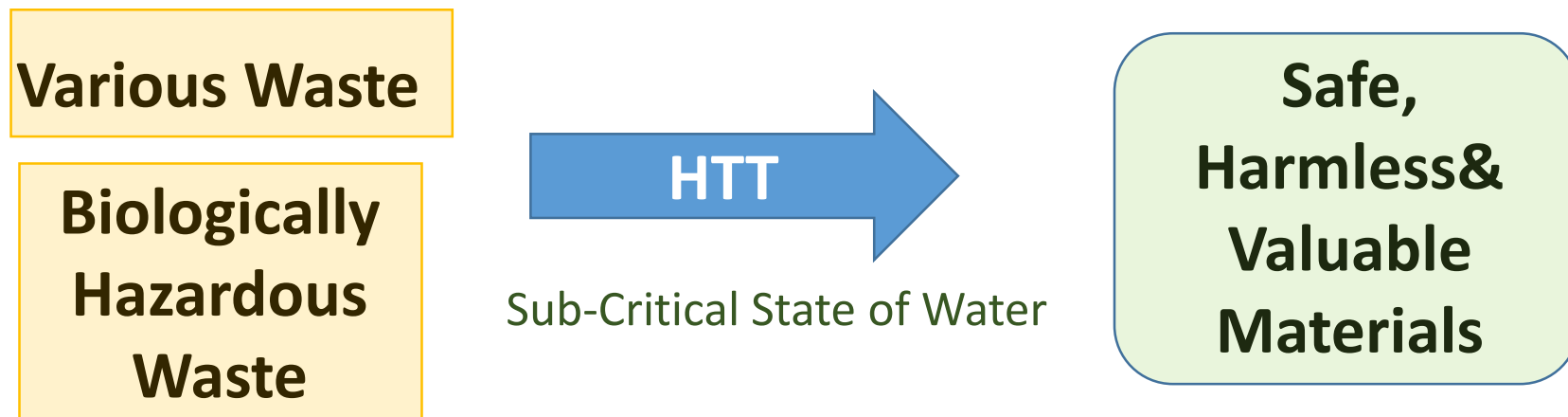


Keys to success in Commercial Tech Transfer

- Continuous Development & Rising Star Technology
- Market Available
- Competitive Price
- Government Policies Supported
- Time

Hydrothermal Treatment/HTT

Hydrothermal Treatment = Big Potential & Opportunities in ASIA



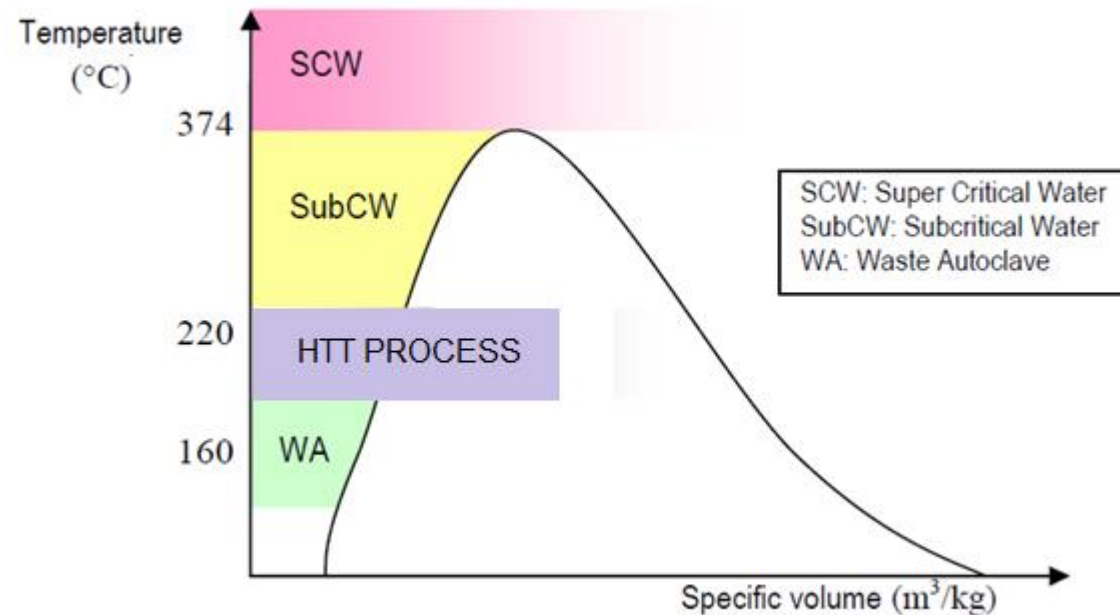
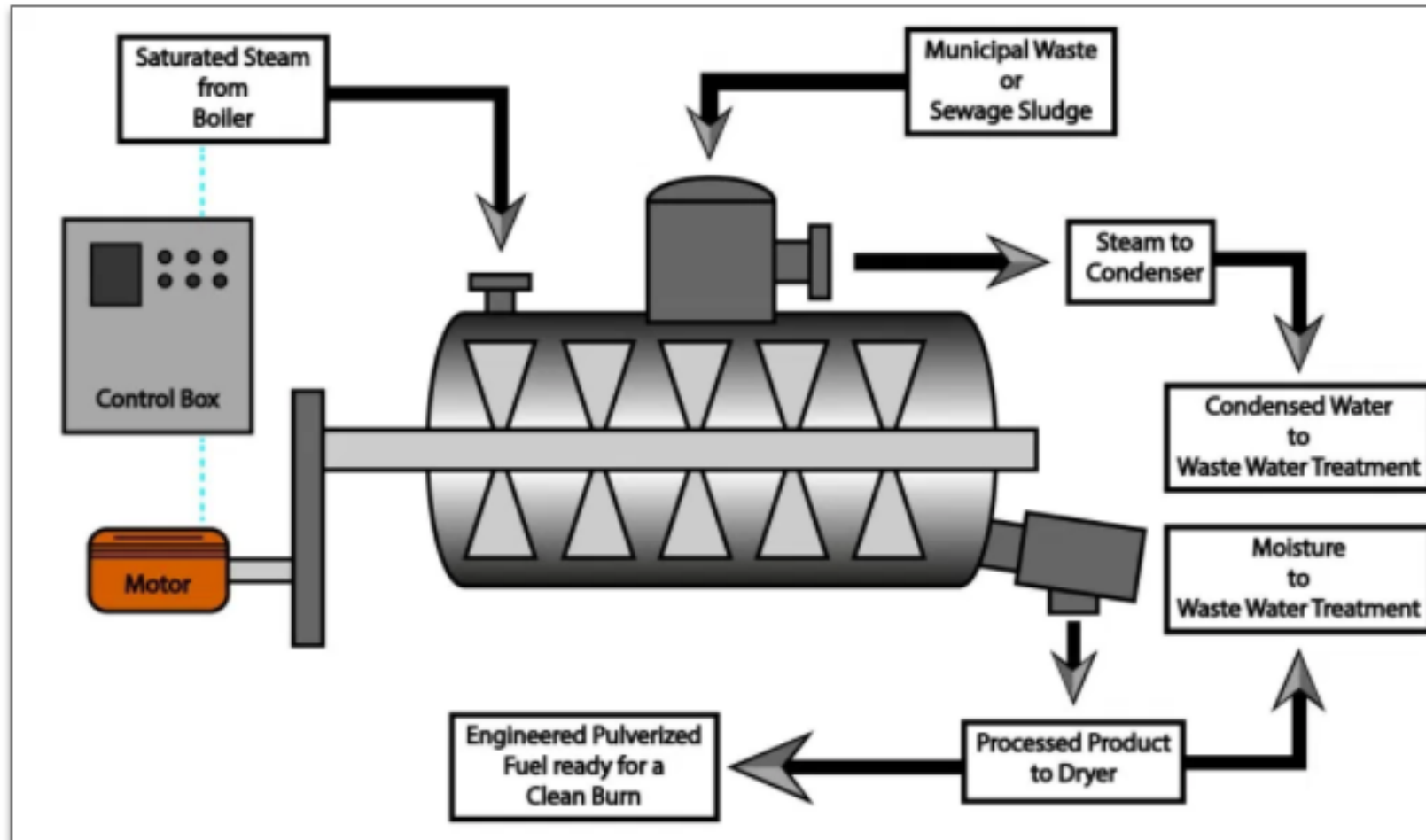


Figure 2 Comparison of various hydrothermal treatment conditions

- **The treatment begins** by loading the raw material into a reactor, and then injecting saturated steam of about **200 °C and 2 MPa** into the reactor.
- **Mixing process** is then conducted by a **stirrer in the reactor** for about **one hour** while holding the temperature and pressure.
- **After finishing** the holding period and discharge of the steam, wet uniform product can be extracted, and then can be easily dried due to improved drying performance of the product.

Features of Hydrothermal treatment

- The emission of dioxins is almost non-existent
- Zero CO₂ emission because of no burning processes
- Excellent sterilization effect for medical wastes.
- The treated products can be utilized as alternative fuels to coal



Sewage Sludge



Food Scrap



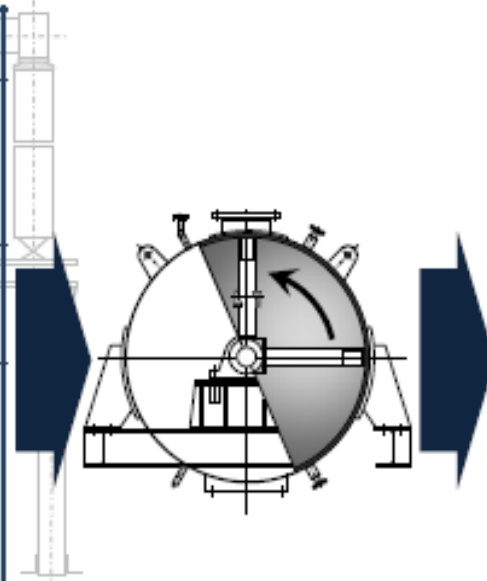
Fishery Waste





Rice Husk



Raw Material	Weight
Food Garbage 	60 kg (50%)
Food Shop Remnant 	
PET Bottle 	24 kg (20%)
General Waste 	
Shredded Paper 	36 kg (30%)
Household Trash 	
Total Weight	120 kg



Description	Pre-Drying 	Post-Drying 
Moisture Content	33.75 kg (45%)	7.25 kg (15%)
Solid Content	41.25kg (55%)	41.25 kg (85%)
Total Weight	75.0 kg	48.5 kg
Weight Reduction Rate	62.5%	40.5%
LHV (kcal/kg)	2,122	3,607

Hokuto Kougyo Co.,Ltd.

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