



Bioenergy market supply chains

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Biomass Markets and Policy

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Upstream

Sources

- Plantation →

Species
Scale

...

- Residues →

Agricultural residues
Forest residues

...

Case 1

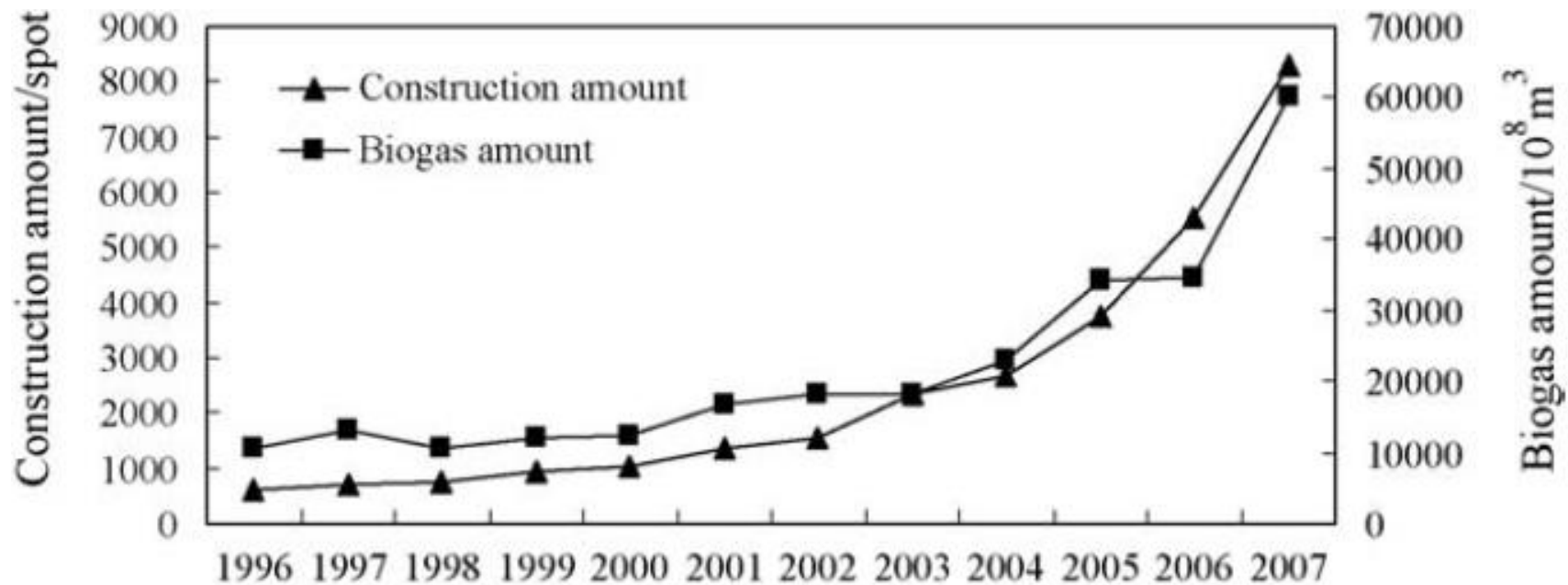


Figure 1 Current situation of large and middle-scale biogas project in China

Case 1

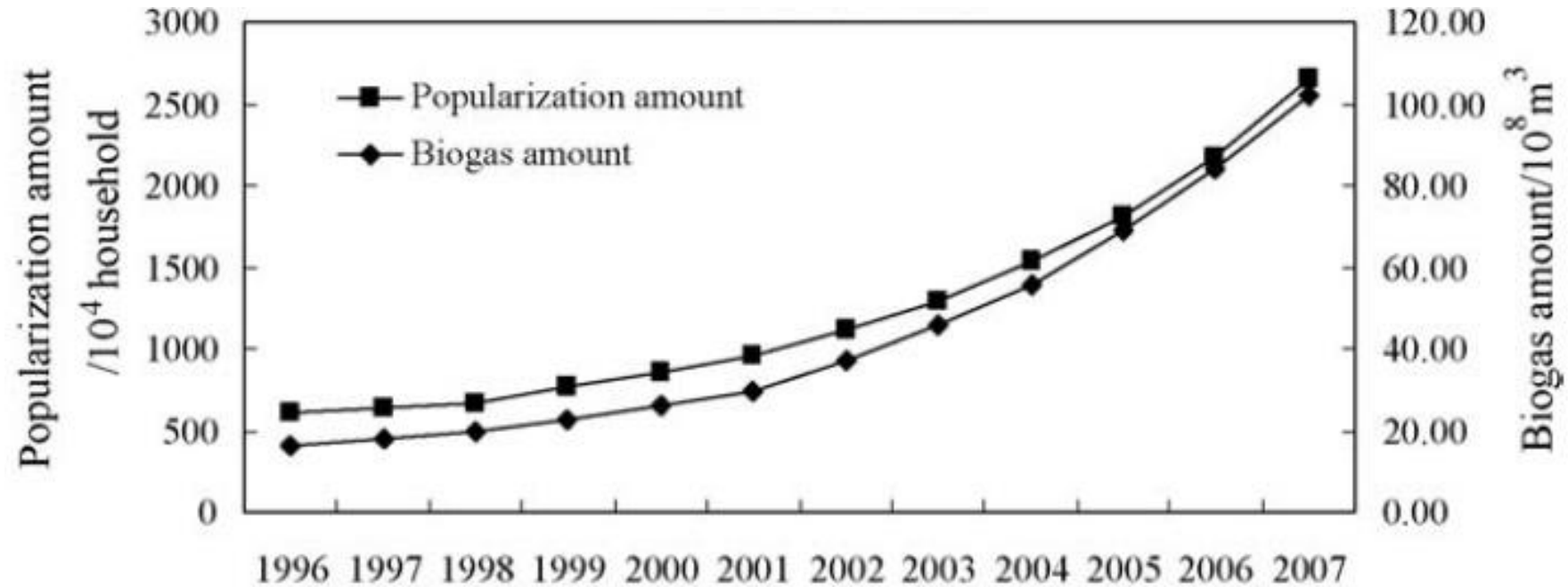


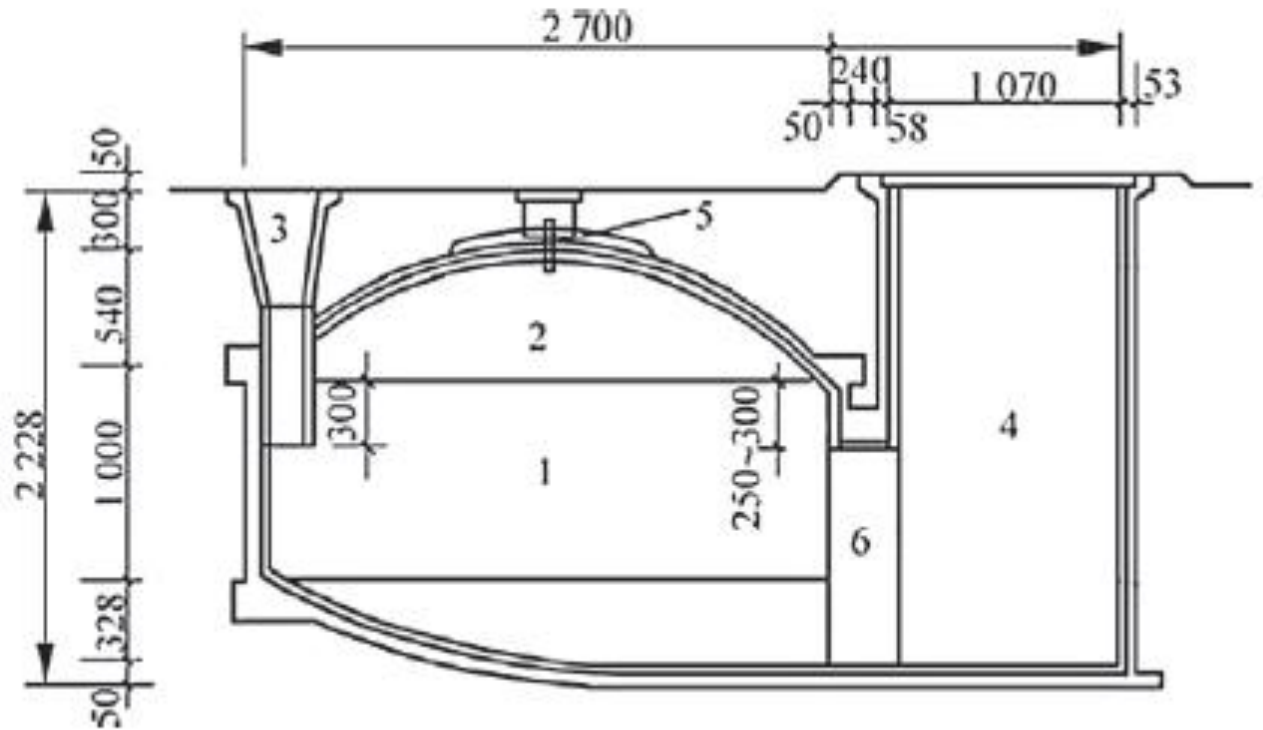
Figure 2 Current situation of household biogas in China

Use	Scale		Annual yield	
	Amount	Unit	Amount	Unit
Biomass power generation	1030	10 ⁴ kW	520	10 ⁸ kW·h
Household biogas	4380	10 ⁴ households	190	10 ⁸ m ³
Large scale biogas project	10	10 ⁴ sites		
Biomass briquettes fuels	800	10 ⁴ t		
Bioethanol			210	10 ⁴ t
Biodiesel			80	10 ⁴ t

Table 1 Current utilization of bioenergy in China

Case 1

Household biogas



- 1. fermentation room
- 2. gas storage room
- 3. material inlet pipe
- 4. material export room, hydraulic room
- 5. gas transport pipe
- 6. export channel for materials

Figure 3 Structure of the hydraulic biogas digester (unit: cm)

Case 1

Biogas sources

- Straw
- Livestock
- Grass
- Food waste
- ...

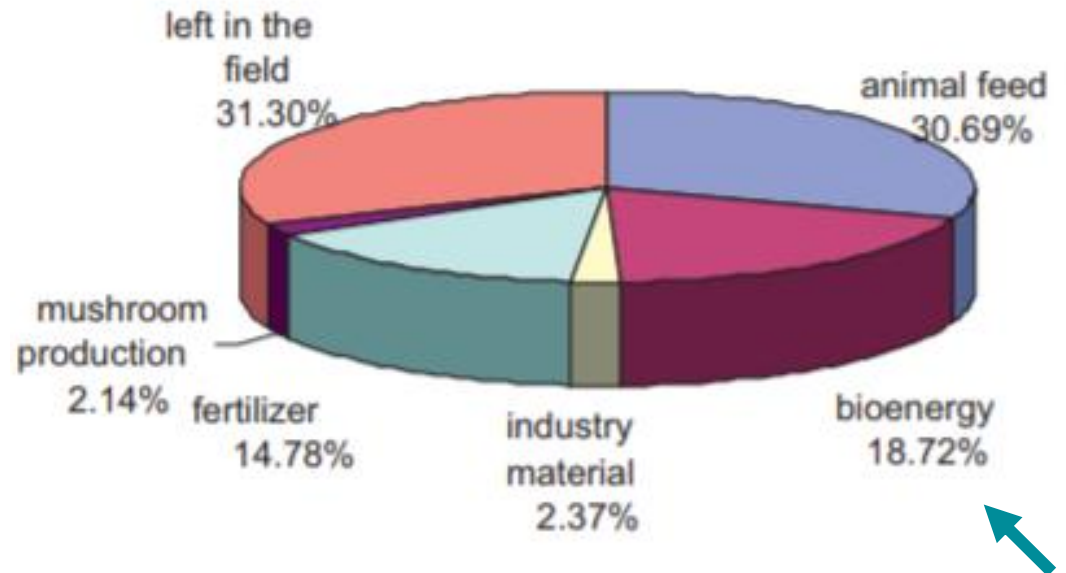


Figure 3 Utilization of crop residues in China

Case 1

Household biogas

-

Difficult to control
Lack of sources
Difficult to maintain

...

+

Clean
Less spending
Fully utilized

...

Midstream

Conversion

Case 2

Plantation



Sawdust



Mushroom
Pellets

...

Downstream

■ Products

Biogas

Biodiesel

Bioethanol

...

Use

Heating

Power generation

CHP

...

- **Sellers**

State-owned company

Private company

Self-employed person

...

- **Consumers**

Household

Company

Big scale project

...

Case 3

- **Products: pellets**



Profits?

Case 3

- **Price**

How much would you like to pay for bioenergy products?

- Free?
- Lower price?
- Don't care?

Case 3

Influencing factors of price

- ❑ Season

- ❑ Logistics
 - Location
 - Distance
 - Vehicles
 - ...

- ❑ Product characteristics
 - Safe
 - Easy to use
 - Clean
 - ...

Bioenergy market supply

Feedstock

Sources
...

Products

Characteristics
Price
Season
...

Logistics

Transport (vehicle)
Distance (location)
Weather
...

Sellers

Competition among sellers
Service
...

Consumers

Preferences
...

Others

Technology
Knowledge
Information (promotion)
...

Exercise

Supply chains

Including : upstream, (midstream,) downstream

Discuss: difficulties when you apply the product into the market

Upstream

Sources

What, where, when

Midstream

By-products

Downstream

Products and uses

Product: biogas, bioethanol, biodiesel...

Uses: heating, power generation...

Proposed consumer and seller

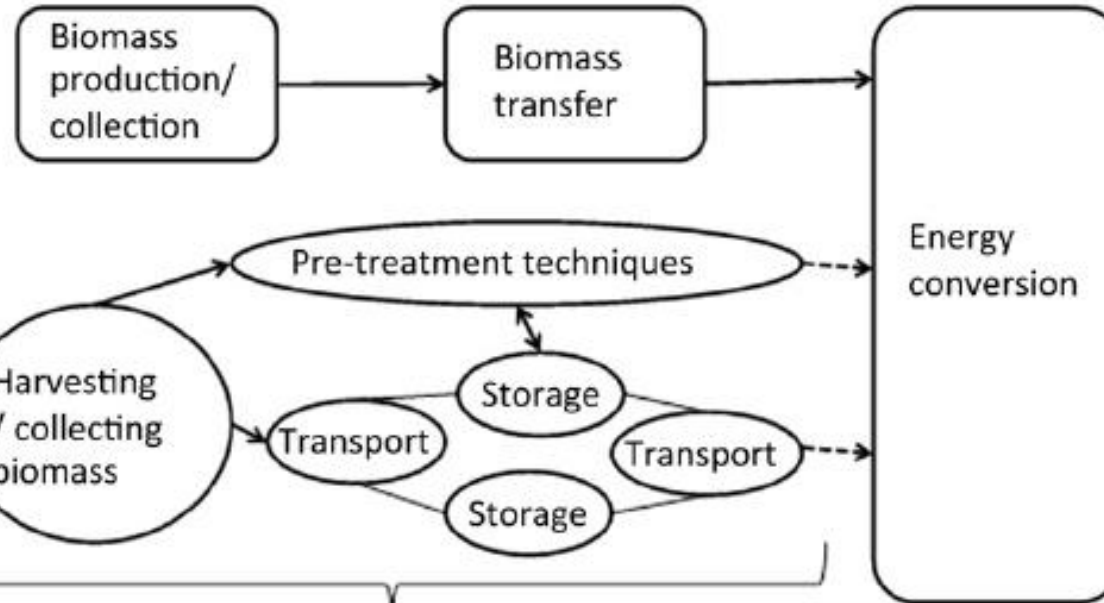
Household, company...

Difficulties

Logistics, products, sellers, consumers...

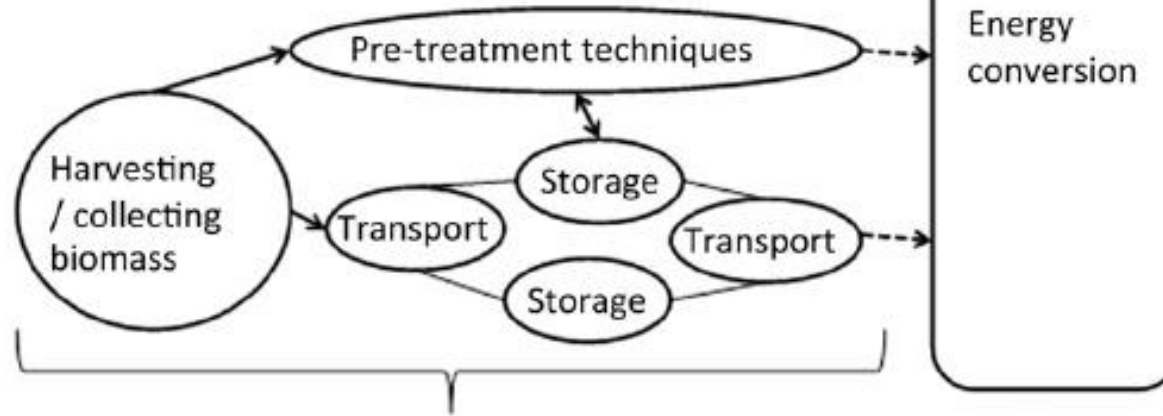
Upstream

**Simplified
bio-energy
supply chain**



(Midstream)

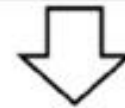
**Biomass
flow
through
operations**



Downstream

**Supply chain
wide
optimization**

Supply system design and co-ordination



Purpose

Feedstock supply:
-Stable supply
-Competitive price

Figure 4 Facilitating biomass flow along the bioenergy chain