Process Development & Optimization

- Transferring process from external lab to IBIG pilot plant

Ideation

- Business and technology
- Feasibility check
- Scalability check

Commercialization

- Regulatory affairs
- Incubation & Acceleration
- Collaborative research & Co-creation
- Analytical solutions
- Technical support & Troubleshooting
- Market penetration

Scale-up

- Robustness & efficiency checks
- Demonstration of sample products

Technology Transfer

- Offshore production
- Foreign-Direct Investment

Training

Building Q

Building R

Downstream Process

Product recovery and Purification processes

Upstream Process & Green Chemistry

Pretreatment and Fermentation processes

IBIG
Industrial Bioprocess Innovation Group

Great Facility and Great Team for Great Solution

NSTDA

EECi
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IBIG
Industrial Bioprocess Innovation Group

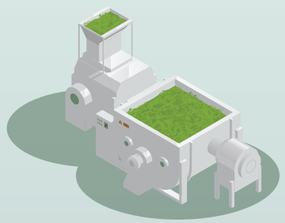
- **No.1** integrative biorefinery R&D and commercialization hub in Southeast Asia
- **Enabling** scale-up process development
- **Empowering** sustainable innovation

Exclusively at EECi Biorefinery Pilot Plant

- Experienced team to boost your project from ideation to commercialization
- Largest integrated biorefinery infrastructure in Southeast Asia
- Full GMP compliance
- Business network opportunities
- Corporate tax exemption up to 15 years
- Smart visa for international citizen and 17% flat tax rate exemption

Biomass Pretreatment

"Liberate what's needed for fermentation"



Breaking down cellulosic materials into digestible molecules

- Cost-effectiveness through the valorization of biomass in proximity as Thailand has agricultural raw materials, i.e., cassava, sugarcane, oil palm, and durian.
- Unique industrial by-products from related industries, including pulp and paper industry, food and beverage industry, and biofuel industry.
- Cost-efficient pre-treatment strategic design.
- Multi-compound extractions to leverage efficiency.

Upstream Fermentation

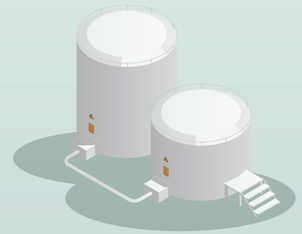
"Intensify fermentation process from petri dish to bioreactor"

Experience state-of-the-art cell culture techniques and harvesting process

- Full flexibility.
- Bioprocess troubleshooting.
- Customization of stable processes for scale-up.
- Risks mitigation through scale-down studies.
- Reduction of COGS through economies of scale and process optimization.
- Scale-up of classic biomass fermentation and precision fermentation.

Downstream Process

"Overcome the barriers of inefficiency"



A robust downstream process is when it coordinates with the interconnected upstream process.

- Simplification of downstream process through standardization.
- Integration of upstream and downstream processes as we have a single workflow.
- Enhancement of the purity of your desired products at a competitive cost.

Green Chemistry

"A consideration for environmental impact"

Minimize the use of hazardous substances while maximizing production efficiency

- Utilization of eco-friendly solvents.
- Exploration of new catalytic strategies to minimize waste.
- Reduction of carbon footprints with clean technologies.
- Carbon credits trading.

Example Equipments

- 3,000 L Reactor
- Decanter Centrifuge
- Plate and Frame Filter Press
- Etc.

- Very Large 15,000 L Fermenter
- Mobile Station to Install Your Own Equipment
- Etc.

- Centrifuges
- Evaporators
- Filters (Dead-end and Crossflow)
- Chromatography systems
- Etc.

- 1,000 L ATEX Reactor
- Up to 5,000 L ATEX Processing Tanks
- 200 L Fine-Chemical
- Reactor
  Etc.