Bio- Circular- Green- (BCG) Economy Implementation in Thailand

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Outlines

• About IPPD
• Why BCG?
• The way we drive from National Policy to Implementation
• Conclusion
About IPPD: Institute of Public Policy and Development

- It was Established through a cabinet resolution on Sept. 25, 2018
- It is designed to serve as a ‘Think Tank’ and ‘Policy’ Lab, providing support to the Office of the National Economic and Social Development Council.
- It concentrates on comprehensive policy research on various dimensions of Economic, Social, and overall Developmental aspects

Mission

1. **In-depth for economic and social research**
   - Development of strategic analysis tools
   - Capacity building for policy strategists
   - Big data development in policy research and implementation

2. **Strategic Foresight / Trend & Future Analysis**
   - Horizon scanning / scenario analysis
   - Strategic environment assessment

3. **Policy Design and Development**
   - 13 Pivots in the 13th National Economic and Social Development Plan
   - Sustainable Development Goals
   - National Competitiveness

**Approaches**
- Future Lab
- Policy Lab
- Policy Sandbox
- Design Thinking
- Academic Platform & Network
Organization Chart

Office of the National Economic and Social Development Council

Phraya Suriyanuwat Foundation

IPPD Board of Directors

IPPD Director

R&D Team

Supporting Team

Economic Intelligence and Foresight
- Analyze and forecast situations, and trends of changes related to economic, social and environment.
- Analyze and research in-depth on strategic development issues that are interconnected in various dimensions, and consistent with the targets of National Economic and Social Development Plan

Big data and Data analysis
- Develop data linkage platform for supporting the development of policy research and predicting/modelling the outcomes

Public Policy Analysis and Development
- Design and develop public policies that can practically implemented
**Why BCG?**

Unbalancing...

- Human Behavior
- Nature
- Tech & Industry
- Human Behavior
Biodiversity collapse
Climate change
Recession
COVID-19
Be sure to wash your hands and all will be well.
How to Alleviate Those Issues?
Sustainable Development Goals

For countries with missing data, the most recent year of the backdated SDG Index Score may differ slightly from the published SDG Index Score.

Select one of the SDGs to see it on the map

https://dashboards.sdgindex.org/map
National Economic and Social Development Plan (NESDP)

13 Milestones for Thailand’s Transformation

1. Production Base for Smart Electronic Devices
2. Regional Strategic Gateway for Trade, Investment, and Logistics
3. High-value Medical and Wellness Hub
4. World’s Major EV Production Base
5. Quality and Sustainable Tourist Destination
6. High-value Agriculture and Processed Agricultural products
7. Strong, High-potential, and Competitive SMEs
8. Livable, Safe, and Sustainable Regions and Smart cities
9. Less Intergenerational Transmission of Poverty and Social Protection for All
10. Circular Economy and Low-Carbon Society
11. Reduced Risks from Natural Disasters and Climate Change
12. Key Enablers for Thailand’s Transformation
13. Modern and Effective Government

+ Philosophy of Sufficiency Economy
[moderation, reasonableness, self-immunity]
The world population projected to reach 9.8 billion in 2050

Tapping the World Food Security and Saving the Planet (Food exporter)

Climate change

Environmental goals

Social goals

Joining Global efforts to combat climate change by reducing natural resource consumption by one-fourth and cutting down greenhouse gas emissions.
Thai Cabinet approved the BCG Action Plan to drive BCG in the country from 2022 and 2027 with a total budget of ~41 billion baht (~USD 1200M)
ECOSYSTEM TO SUPPORT BCG BUSINESS IN THAILAND

National Managing Committee: Chair – Prime Minister
National Driving Committee: Chair – Minister of Higher Education, Science, Research, and Innovation
THAILAND’S BIO-CIRCULAR-GREEN ECONOMY (BGC) MODEL

Bioeconomy
Involves the production of renewable biological resources and the conversion of these resources into value added products

Circular economy
Aims at reusing and recycling resources

Green economy
Determines to keep economy, society and the environment in balance, leading to sustainable development

FOOD AND AGRICULTURE
MEDICAL AND WELLNESS
ENERGY, MATERIAL AND BIOCHEMICAL
TOURISM AND CREATIVE ECONOMY

01 Policy and Management
02 Science, Technology and Innovation
03 Participation from ALL Sectors
AGRICULTURE AND FOOD

VALUE CREATION

Functional Food
Biotechnology
Agricultural Products/Productivity
Precision Agriculture, Seed Technology

AGRICULTURE

- Thailand is among the top producers and exporters of several agricultural commodities.
- Well-endowed natural resources, from diverse crops to farming and fisheries.

FOOD

- >13,000 food processing and beverage factories (Department of Industrial Works (DIW), 2021), generating 100 billion USD, one-third of which are export income
- Rank 13 largest food exporter in the world, and the 2nd in Asia
- Top export products: rice, canned and processed seafood, fresh and processed fruits, chicken meat and processed chicken and cassava products
- 100,000 operators of local food and street food
- Health food and beverage is a fast-growing sector, with 6 billion USD market value

Growth Opportunity

- Functional health food and beverage
- Quality and safety of local and street food upgrade
- Herbal extract & natural products
- Product diversification: herbal plants, fruits, seeds, ornamental plants, edible insects
- Premium farm products with technology and GAP
MEDICAL AND WELLNESS

PHARMA
- 3.8 billion USD of imported drugs and pharmaceutical products
- 90% of locally-manufactured drugs are generic drugs, producing from imported API
- 148 GMP-certified pharmaceutical manufacturers, only one is capable of producing biosimilars

MEDICAL SERVICE
- 70% of foreign patients are medical tourists
- Ranks 5th in Medical tourism by Medical Tourism Association
- 8.8 billion THB (290 million USD) revenue earned from clinical research

MEDICAL DEVICES AND SUPPLIES
- Trade surplus with 100 billion THB (3 billion USD) export value against 70 billion THB (2.3 billion USD) import value 
- 79 billion THB (2.5 billion USD)
- largest medical device market in ASEAN with an 8-10% annual growth (world's average is 5.2%)
- >1,500 medical device manufacturers, mostly joint-venture SMEs with foreign partners
- 84% of export products are medical supplies (alcohol & mask), while import products are mostly medical equipment (ultrasound machines, x-ray machines)

COSMETIC
- 300 billion THB (10 billion USD) market size
- 1,800 cosmetic manufacturers, 90% are SMEs

VALUE CREATION
- Biologics
- Precision Medicine
- Omics
- Biosimilar, Herbal and Medical Products
- Bioactive Compound
Growth Opportunity

- Biomaterials and functional ingredients from biorefinery application
- High performance battery and energy storage
- Community-based power plant with advanced energy storage system and blockchain-based smart microgrid
- Renewable energy production: RDF (refuse-derived fuel) and biogas

**ENERGY**

- 60% of total energy consumption are imported
- 16.5% of total energy consumption are from renewable source, 2030 target is 30%
- Enough biomass to meet 30% renewable energy target
- Increase the proportion of new electricity generation with renewable energy not less than 50%

**MATERIALS AND BIOCHEMICALS**

- Worldwide market value expected to reach 487 billion USD by 2024
- Strategy to increase value of biomass and farm commodities by turning into functional ingredients, bioactive compounds and building blocks for chemicals and high value biochemicals
- 8.36 million tons of biomass or agro-waste from agriculture & food sector in Thailand could be turning into raw material of RDF
TOURISM AND CREATIVE ECONOMY

TOURISM
- 0.4 trillion THB (12 billion USD) revenue, 6 percent from foreign tourist reduce from two-thirds before COVID pandemic
- In 2022, Thailand ranks 4th best tourist destinations in the world

CREATIVE ECONOMY
- Current value of Thailand’s creative economy is 10-12 percent of GDP or 14-17 percent of national income
- The higher value comes from the functional creation group, cultural heritage group
- The design is the most valuable group and followed by handicraft and fashion group with combined value of 9.5 percent of GDP

Growth Opportunity
- New types of tourism: agritourism, low-carbon tourism and knowledge tourism
- Sustainable goods and services with circular design and green technology
- Environmental rehabilitation, secondary-city destination, sustainable tourism
- Public payment gateway for tourism businesses
EXPECTED OUTCOME OF BCG MODEL IN 2027

Sustainability of resources and the environment
- 1/4 reduction in natural resource consumption
- 20% reduction of greenhouse gas emissions
- Add at least 0.5 million ha of forest area

Socioeconomic prosperity
- Improve income inequality of 10 million people
- Reduce the proportion of undernourished population to 5%
- Increase health inequality of at least 300,000 people
- Increase the number of energy self-sufficient communities by 20%

Sustainable economic growth
- Economic value of the BCG industries up by 1 trillion THB
- 20% increase in the proportion of high-value products and services
- At least 50% more income to the grassroots

Self-reliance
- At least 1 million workers are retrained
- 1,000 new startups and IDEs
- Improve negative technology balance of payment by at least 20%
- 20% reduction in medical and health supplies import
• Office of SMEs Promotion (OSMEP) provides training and financial support for MSMEs.
• OSMEP has supporting hubs in all provinces of Thailand.
• It has about 21,747 SMEs with their businesses related to BCG.

Department of International Trade Promotion has established a “BCG Heroes” project. It selects SMEs related to BCG and support them so that their product can go internationally.

NSTDA provides training course related to BCG.
Financial Support Mechanisms

Financial institutions have plans to support BCG businesses in the overall amount of ~150,000 Mbaht (~USD4,300 M) from 2020-2027.

**SME Development Bank** sets up a “BCG Loan” program for supporting BCG businesses in the amount of ~50 MB/SME.

**Bank for Agriculture and Agricultural Cooperatives** allocates ~60,000 MB from 2022-2027 for supporting BCG model to its customers.

**Export-Import Bank of Thailand (Exim Bank)** aims to expand the proportion of loans for businesses conforming to the BCG model to 50% (100,000 MB) of its anticipated total outstanding loans in the next three years from 2022 (the current level of 28%). The bank will focus on promoting renewable energy and food packaging. [More](www.bangkokpost.com/business)

**The Industry Ministry** is supporting of 1,000 MB in soft loans for SMEs that adopt the BCG economy model. Each owner can apply for a maximum loan of 15 million baht for a borrowing period of 10 years. The principal payments will be waived for 18 months, with an interest rate of 2% a year. [More](www.bangkokpost.com/business)
The cabinet approved an extension of a 25% corporate tax exemption for Bio-Plastic industry companies until end of 2024 in order to promote Thailand as an ASEAN bio-hub. In 2020, there were 14 companies eligible for the tax measure worth 18.3 million baht.

In the government procurement process, it allows SMEs to propose prices 15% more than the lowest proposed prices from non-SMEs.

Ministry of Commerce organized 3-Day Thailand Local BCG Plus Expo 2023 in July 2023 to promote BCG products and services.
Carbon Footprint Label

826 Companies/ 7300 products submitted, 278 companies/3050 products approved
[mainly related to Food, Construction, Packaging, Petrochemical, Handicraft]

http://thaicarbonlabel.tgo.or.th/index.php?lang=EN&mod=Y0hKdlpIVmpkSE5mWVhCd2NtOTJZV3c9
Updated: July 17, 2023
Environmentally Friendly (CIRCULAR DESIGN)

Production Process (PRODUCTION PROCESS)

CIRCULAR ECONOMY MANAGEMENT SYSTEM

Management (END-OF-LIFE)

Agri-food × 16
Plastic × 9
Packaging × 48

Building material × 170
Fashion, Lifestyle × 133

Fruita Biomed Co., Ltd., a food and beverage producer and exporter. The company produces **PHA (Polyhydroxyalkanoate) bioplastic and PHA bioplastic compound developed from organic waste**. PHA bioplastic is used for a wide range of packaging products for food and medical supply.
EXAMPLES OF BCG-IN-ACTION:

Card holder  Sneakers  Tote bag  Wine bag

SUSTAINABILITY / RESPONSIBILITY / TRACEABILITY

#madefromfruitwaste
EXAMPLES OF BCG-IN-ACTION: From water hyacinth to products

- Basketry
- Cushion bead
- Shawl

https://www.bangkokbiznews.com/lifestyle/893797
Carbon Market Support

- Thailand launched its first carbon credit exchange,
- The new carbon market, called FTIX, will be operated by the Federation of Thai Industries, which comprises about 12,000 private companies across 45 sectors.
- Its supporting platform will allow firms and government agencies to buy and sell carbon credits and track their emissions on an online dashboard.

Thai farmers can sell carbon credits at a price of 400 baht per 1 ton of carbon equivalent. (Farmer who grows rice in 1 rai of wet and dry fields will earn income from the sale of 800 baht of carbon credit)
From Wasted Tires to Valuable Products

https://78transform.co.th/
Recycled Carbon Black (RCB)

Convert RCB to Graphene

Pyrolysis Oil

Water cooling System

Dust Collector System

Combustion gas, Flue gas and Waste water treatment system

Magnetic Separator

CARBON SILO

WIRE STEEL PACKING

CARBON PACKING

- Recycled Carbon Black (RCB)
- Convert RCB to Graphene

https://78transform.co.th/
EECi: 'THE BCG INNOPOLIS'

An ecosystem to translate research and innovation into sustainable regional economic development and societal well-being.

Service Infrastructures @ EECi

Biorefinery Pilot Plants
Greenhouse & Plant Factory
Smart Farming and Demo Sites
Modern Aquaculture Facility
Sustainable Manufacturing Center: SMC
Zn-Ion Battery Pilot Plant
CAV Proving Ground
UAV Sandbox
3-GeV Synchrotron Facility

Grand Opening in November 2022
A MI Base is a microbial database containing > 30,000 species of microbes (bacteria, archaea, fungi, algae, protozoans, and viruses). The database is readily and easily searchable via a website interface. AMIBase is linked to the ASEAN species database of the ASEAN Clearing-House Mechanism (CHM) to serve biodiversity conservation purposes2.
National Biobank of Thailand (NBT) supports infrastructure for the conservation of the biological resources of Thailand, and carries out research using advanced technology on the value and potential for development of biological resources from the genetic to the ecosystem level. Biomaterials collected and stored at Biobank are a vital platform for maintaining the current and future bio-economy of the kingdom.
National Omics Center (NOC)

- Advanced OMICS-related infrastructure to promote the use of OMICS-technologies
- Experienced research staff to assist R&D stakeholders to utilize various OMICS technologies to improve their insights into the core biotechnology and thus able to improve the underlying productivity.
- Common services include whole genome sequencing of new species, plant screening service via genotyping, proteomics and chemical profiling of plants/microbes

https://www.nstda.or.th/noc/services/genomics/
Conclusion

Challenges in driving and implementing BCG Economy Model in Thailand can be overcome by creating UNDERSTANDING in ALL LEVELS

- Government officers
- Financial sectors
- Private sectors
- General public

National Committees that involve all related government offices, associations, and NGOs are NEEDED

Training, Market Promotion, Financial Mechanism, and STI Support are also important in the ECOSYSTEM

KEEP MOVING & IMPROVING !!!
Acknowledgement

National Science and Technology Development Agency
(Secretariat of National Committees on BCG Economy)
Thank you