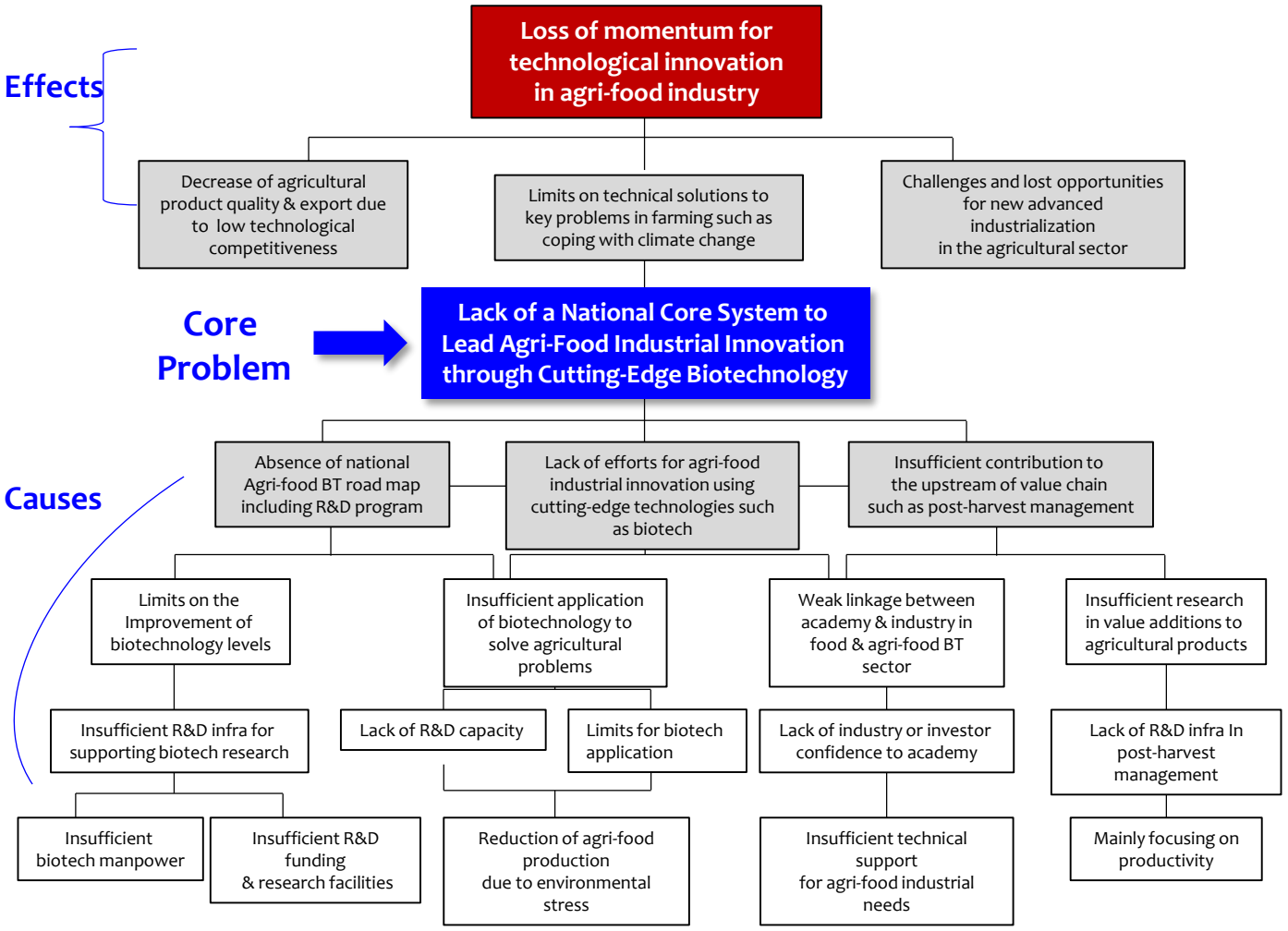
UR-T1182: Promoting Productive Transformation and Competitiveness of Uruguay's Agri-Food Industry based on Science Technology and Innovation

Master Plan Draft for BT Center

December 3, 2019

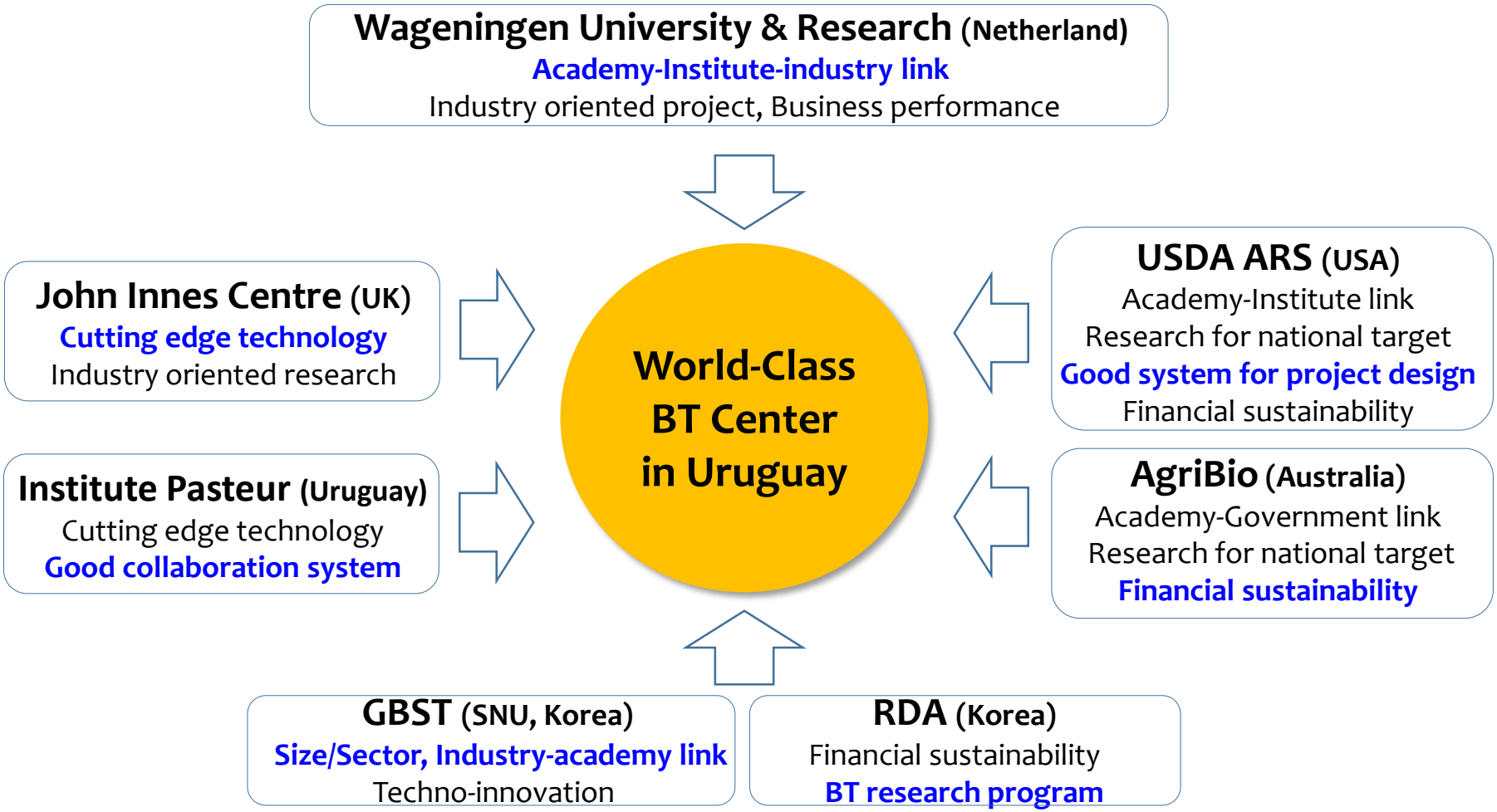

Vision, Mission, Goals,
Expected output & Outcome, etc.
Function
Structure
BT Center
Master plan
Operation
Organization,
Human resources, etc.
Operational schemes,
Management model,
Business model, etc.
Strategy
Strategies for Achieving
the Goals, Roadmap, etc.
Center Design
Work Plan
Location, Size,
Infrastructure & equipment
R&D program and projects,
Budget allocation,
Goal/strategy/roadmap in detail

Problem Tree in Agri-Food R&D in Uruguay



Best models for the BT Center

Key concepts : World best BT research capacity, Play a key role for solving national issues, Contribute to both industry and science sector, Financial sustainability, etc.



Vision, Mission & Function of BT Center

A World-class BT Center

Leading the National BT R&D Capacity Enforcement

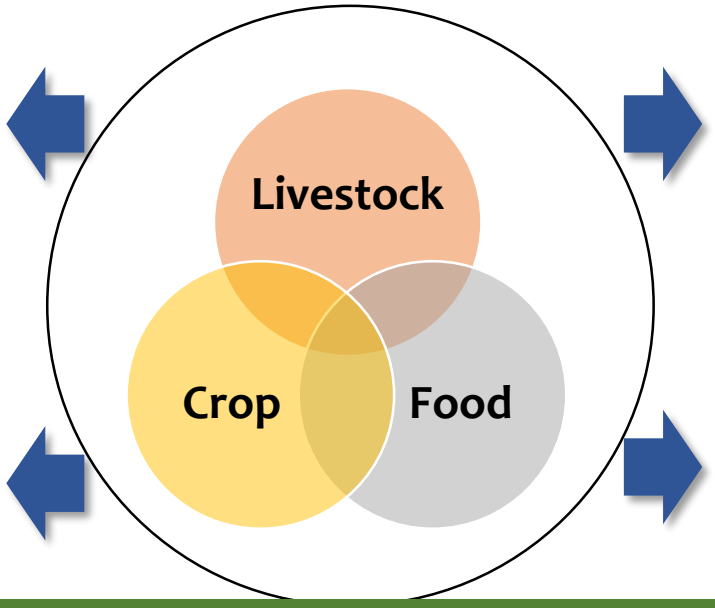
Leading Innovation in the National Green Bio industry

Internationally Competitive Biotech R&D Capacity

Cutting-edge BT research

National Core BT Infra

- Supporting BT R&D
- Training & Education



Technology Innovations

Industry oriented BT research

Green Biotech Business

Tech transfer,
Support start up companies

BT Center

National Biotech R&D Platform

BT Center

VISION

As one of the world's leading green biotechnology institutes, the BT Center will lead innovation in Uruguay's Green-Bio industry enabling the attainment of the national objective to double agricultural exports by 2050

MISSION

- ✓ Plays the role as a National Core Center for enhancing green-biotech capacity
- ✓ Leads innovation in the National Green Bio Industry with BT base for R&D support

FUNCTION

- ✓ Secure global green-biotechnology competitiveness
- ✓ Enhance the national green BT R&D capacity by providing BT infra
- ✓ Technical support for innovation & application in Uruguay's agri-food industry

Strategy

Focus on

- The leading role for strengthening national agri-food BT R&D Capability
- More productive research to improve the utilization of results
- More active participation of all Uruguay's related agencies

BT Center

GOAL

1. To be an Advanced Country in Green Biotechnology

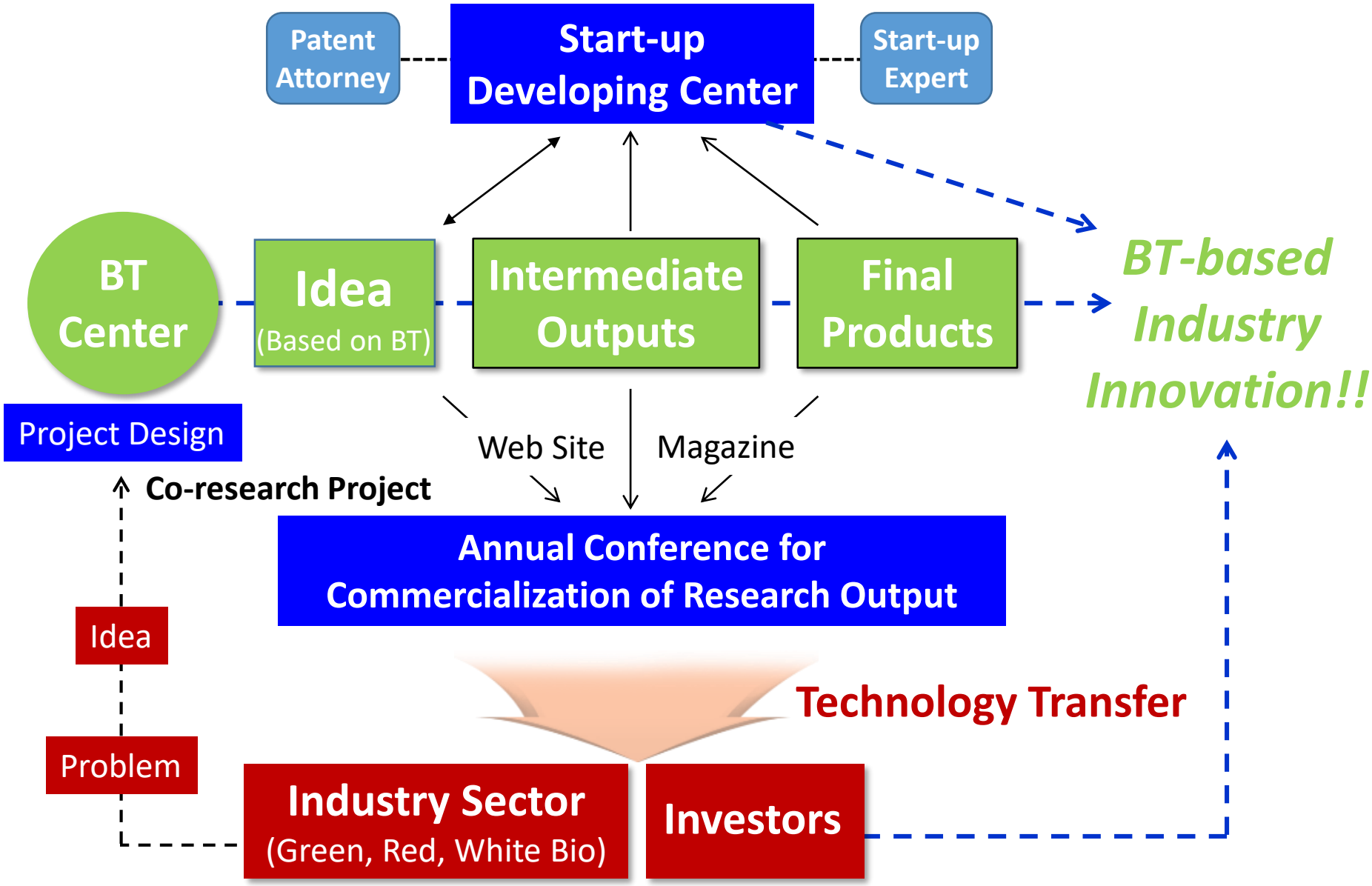
2. To be a World-Class Green Biotech Research Institute

3. To enable a domestic green bio company to break into the Global Top 20 rankings

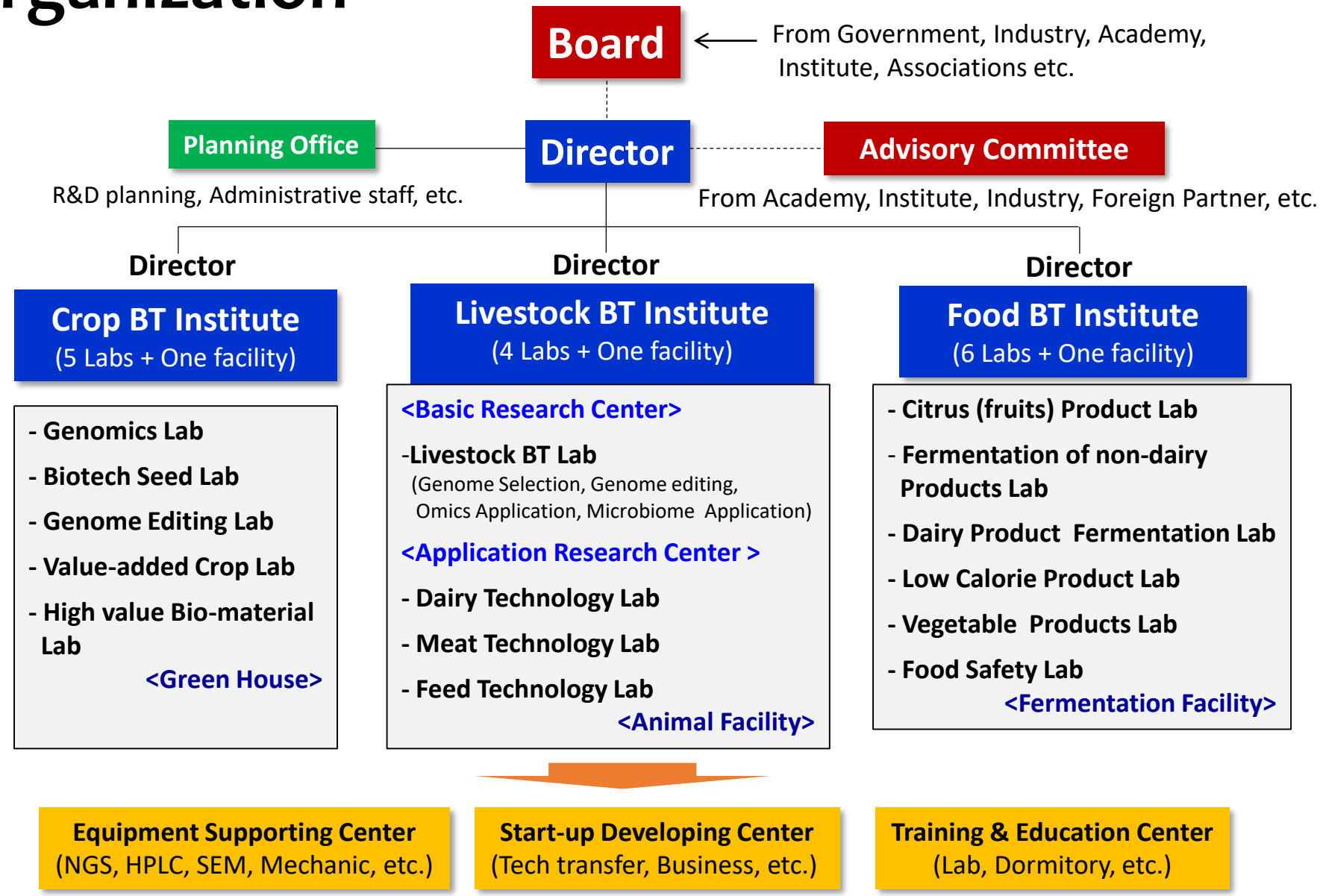
OVERALL STRATEGY

- ✓ Reinforce research capabilities through cutting-edge technology-based research
- ✓ Enhance R&D efficiency by encouraging participation of other research platforms
- ✓ Activate international co-research to become a world-class BT institute as early as possible
- ✓ Increase utilization of research output through industrialization-oriented R&D
- ✓ Increase value of research output by conjunction with Red-Bio industry

Strategy


Patent Attorney
Start-up Developing Center
Start-up Expert
BT Center
Idea (Based on BT)
Intermediate Outputs
Final Products
BT-based Industry Innovation!!
Project Design
Web Site
Magazine
Co-research Project
Annual Conference for Commercialization of Research Output
Idea
Technology Transfer
Problem
Industry Sector (Green, Red, White Bio)
Investors

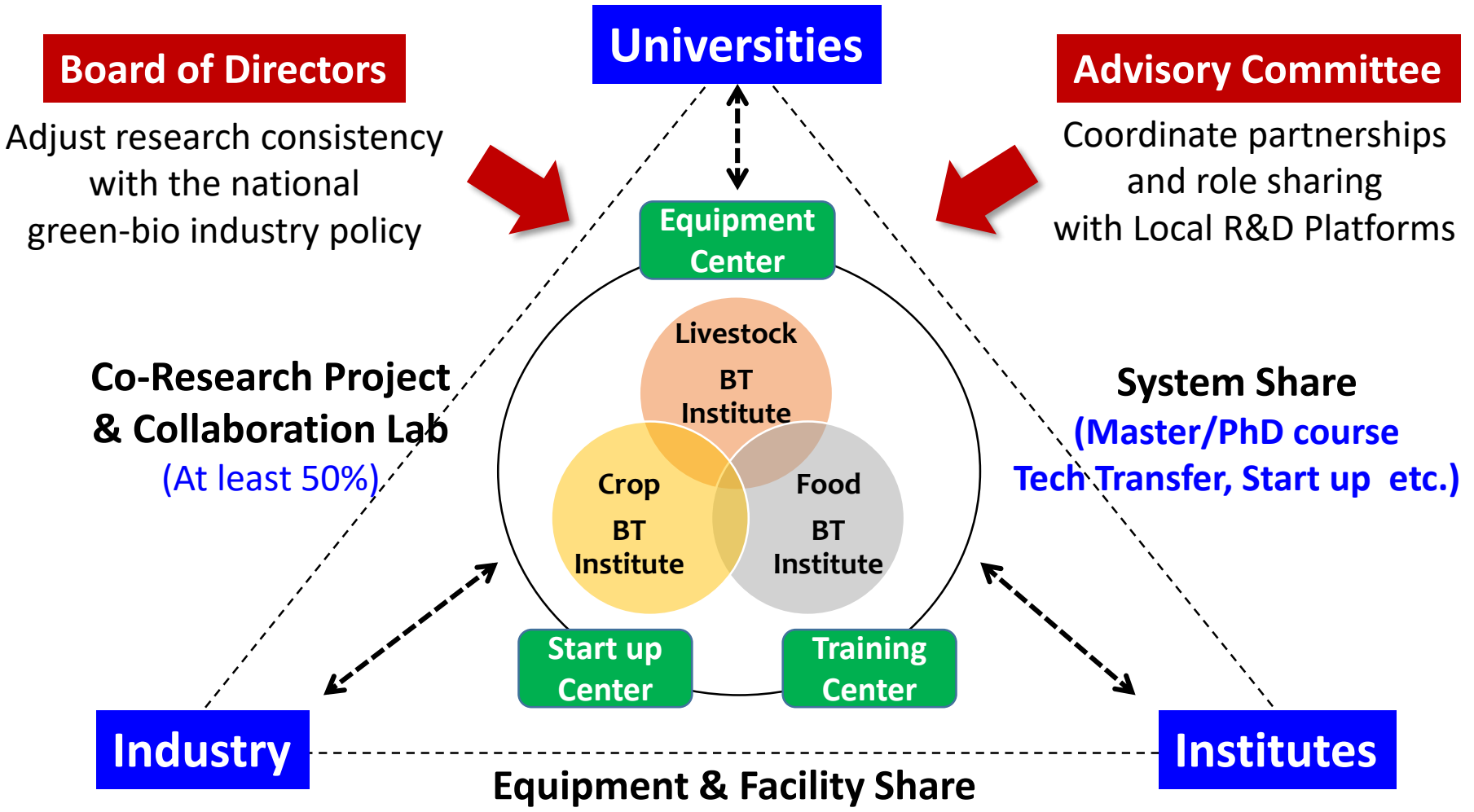
Organization



Three National Green BT Supporting Centers

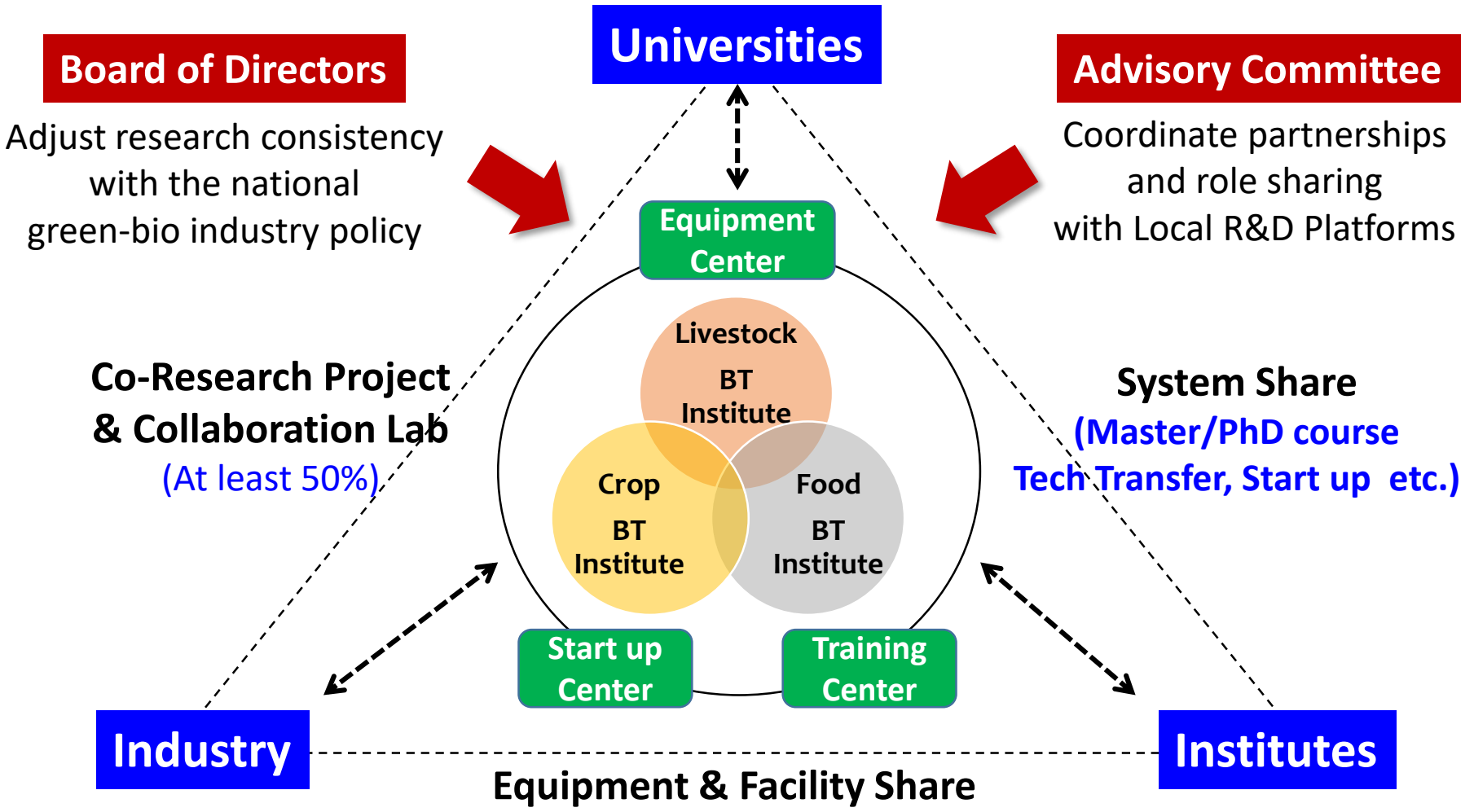
Operational Schemes

Governance through "Board of Directors" and "Advisory Committee"

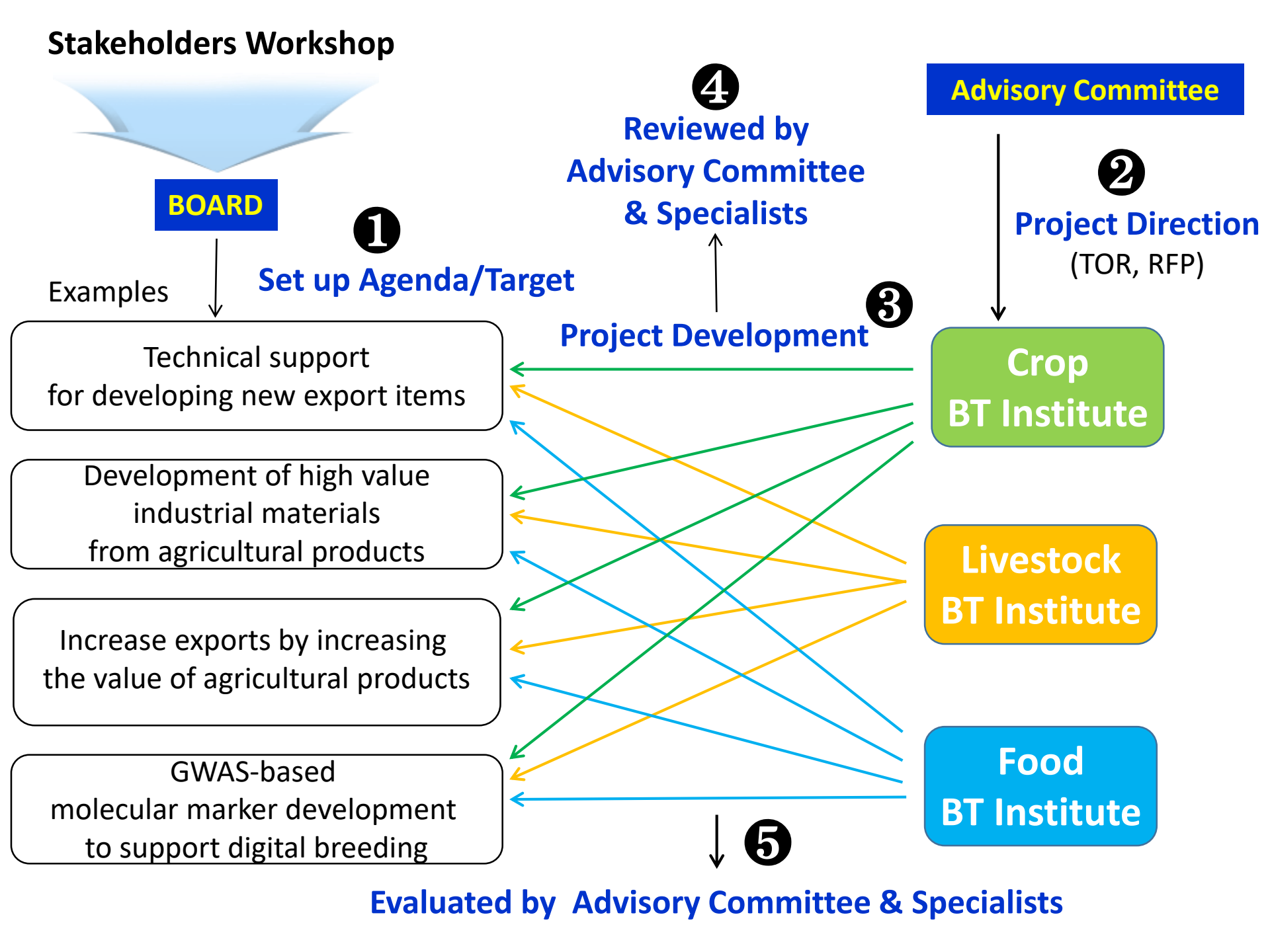


National Green Biotech R&D Platform

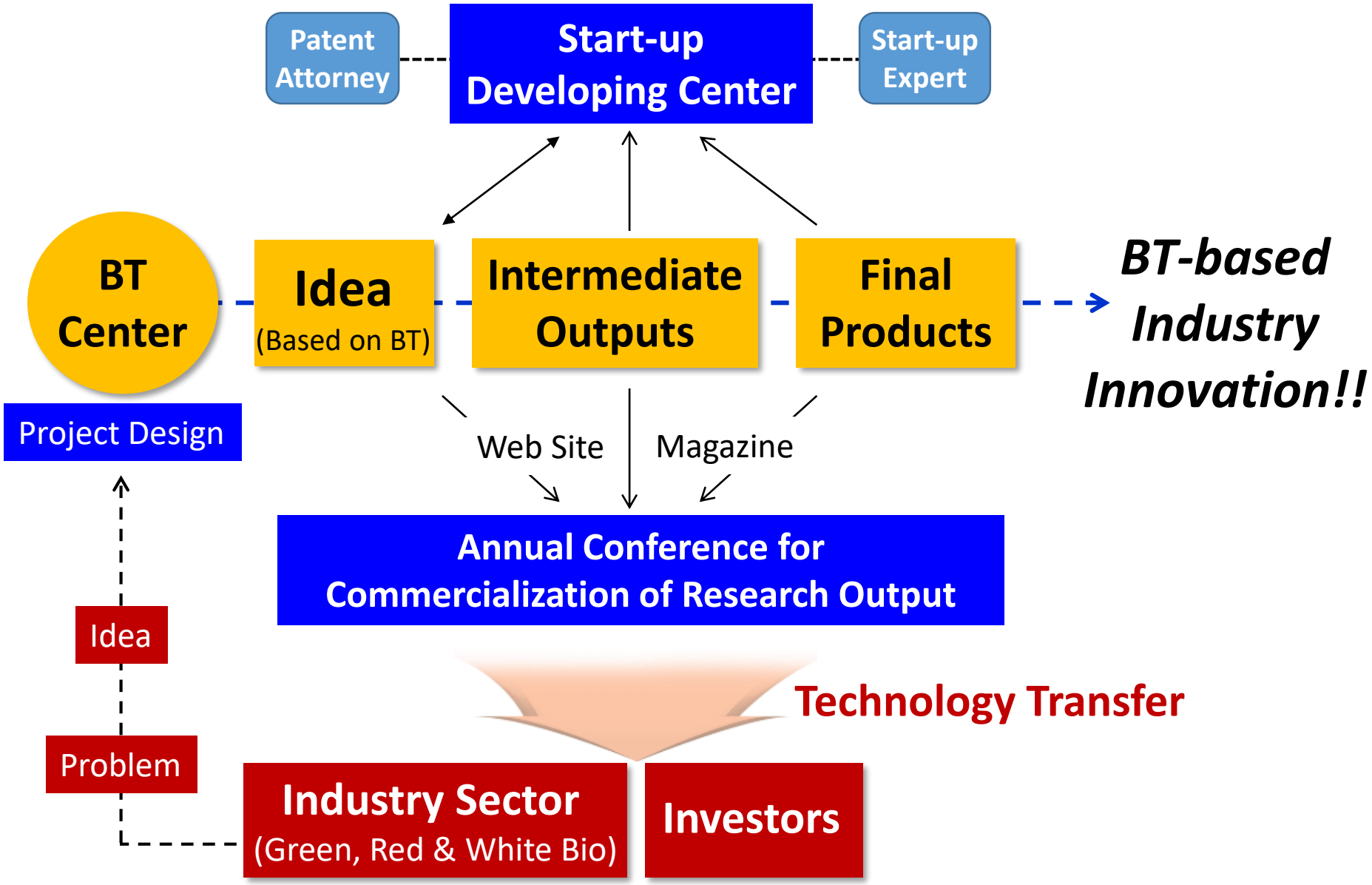
Governance through "Board of Directors" and "Advisory Committee"



National Green Biotech R&D Platform


Stakeholders Workshop
BOARD
❶
Set up Agenda/Target
Examples
Technical support
for developing new export items
Development of high value
industrial materials
from agricultural products
Increase exports by increasing
the value of agricultural products
GWAS-based
molecular marker development
to support digital breeding
❹
Reviewed by
Advisory Committee
& Specialists
Advisory Committee
❷
Project Direction
(TOR, RFP)
❸
Project Development
Crop
BT Institute
Livestock
BT Institute
Food
BT Institute
❺
Evaluated by Advisory Committee & Specialists

Technology Transfer System

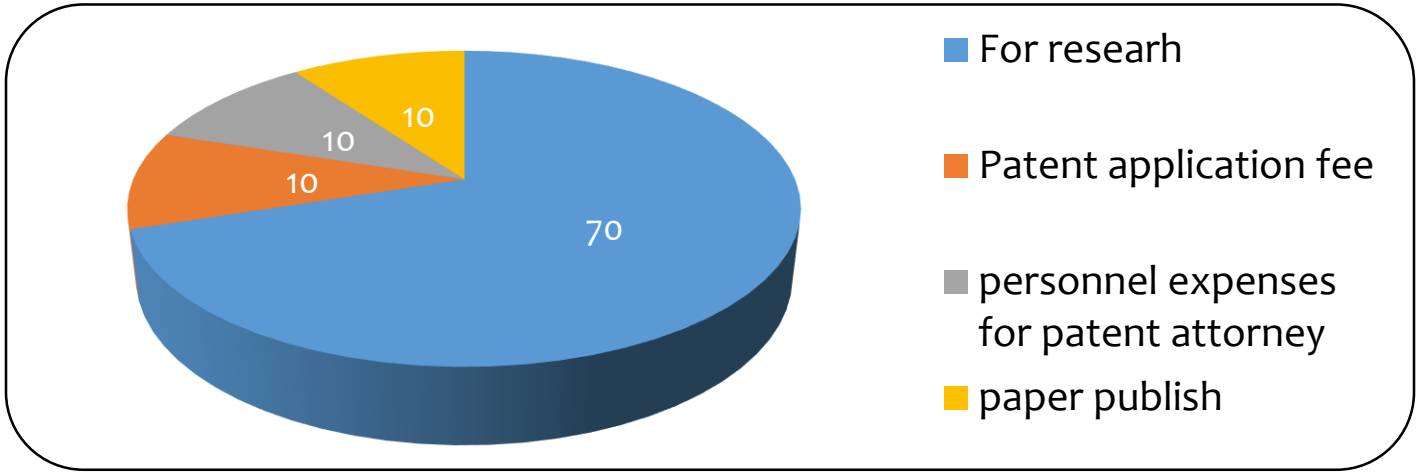

Patent Attorney
Start-up Developing Center
Start-up Expert
BT Center
Idea
(Based on BT)
Intermediate Outputs
Final Products
BT-based Industry Innovation!!
Project Design
Web Site
Magazine
Annual Conference for Commercialization of Research Output
Idea
Problem
Technology Transfer
Industry Sector
(Green, Red & White Bio)
Investors

System Support for Promoting Industrialization

Flexibility in budget usage

Patent fee
from project fund

Patent Attorney joins
project as a project Partner



Faster and more convenient industrialization

Research Projects

Proposal of Research Projects

Crop Sector

Research Project	Target Crop	Target Trait	Collaboration Partner
Development of GM Seeds	Soybean	Drought tolerance Herbicide tolerance Insect resistance	Seoul National University (SNU) & Local Research Institutes
	Corn	Drought tolerance Insect resistance Nitrogen use efficiency	SNU, Local & International Team
Development of Genome Edited Crops	Soybean	High quality	SNU & Local Research Institutes
	Rice	High quality Pest resistance	SNU & Local Research Institutes
	Wheat Sorghum	Fusarium resistance	Local & International Team
	Forage Crops	Productivity Feeding efficiency	Local & International Team
Development of Molecular Markers through NGS/Bioinformatics	All Crops	Productivity, Quality, Biotic/Abiotic Stress	Local & International Team
Metabolic Engineering for Value Addition	All Crops	High Quality Value addition	Industry Sector, Local & International Team

Proposal of Research Projects

Livestock Sector

Research Project	Target Livestock	Target Trait	Collaboration Partner
Agrigenomics Solutions for Breeding Livestock Animals	Cattle	Climate change adaptation Productivity High quality/Value addition	SNU, Local & International Team
	Chicken/Pig	Disease resistance Climate change adaptation Productivity Value addition	SNU, Local & International Team
Microbiota in Livestock Animals	Cattle	Disease prevention High quality/Value addition	SNU, Industry Sector, Local & International Team
	Chicken/Pig	Disease prevention Productivity	SNU, Industry Sector, Local & International Team
	Others	Disease prevention Sustainable production system	SNU, Industry Sector, Local & International Team
Genome-edited Livestock	Cattle	Disease resistance Climate change adaptation Productivity	SNU, Industry Sector & International Team
	Chicken/Pig	Disease resistance Climate change adaptation Productivity Biomaterial production	SNU, Industry Sector & International Team
Omics Analysis	All Livestock	High Quality Value addition Customer-oriented product	Local Team & Industry Sector

Proposal of Research Projects

Food Sector

Research Subjects	Research Projects
Citrus (fruits) products	● R&D of Citrus Fruits, Deciduous Fruits and Their By-products for High Value Added Commodities
Fermentation products (Non-Dairy)	● R&D for Value-Added Well-Aging Non-Dairy Agricultural Products by Using Advanced Fermentation and/or Biotransformation Techniques
Dairy products	● R&D for Value-Added Well-Aging Dairy Agricultural Products by Using Fermentation and/or Biotransformation Techniques
Low calorie products	● R&D for Functional & Value-Added Low-Calorie Commodities of Well-Aging
Vegetable (plants) Products	● R&D for Value-Added Sustainable, Healthy, and High-Protein Food Products Designed for Well-Aging
Food Safety	● R&D for Food Safety and Industrial Applications

Road Map

Road Map

2021~2023	2024~2026	2027~2030
Establishing BT R&D Infra	Activate National level Green Biotech R&D activity	Become an Advanced Country In Green Biotech
Securing BT R&D Capacity	Securing World-Class Research Competitiveness	Become a World-class Green Biotech Research Institute
Creating BT Industrial Ecosystem	Activate Start up in Green-biotech field	Make a Global Top 20 Green Bio Company

Road Map

2021~2023	2024~2026	2027~2030
Establishing BT R&D Infra	Activate National level Green Biotech R&D activity	Become an Advanced Country In Green Biotech

Establish the National Core Center for Equipment Service

Set-up the Real-time Service system & Actual Service in the Core Center
(Equipment, Analysis, Experimental Design, etc.)

Set-up the Collaboration Labs & Co-Projects with Local R&D Platforms

Achieve BT-based R&D innovation on all local research platforms

Road Map

2021~2023	2024~2026	2027~2030
Securing BT R&D Capacity	Securing World-Class Research Competitiveness	Become a World-class Green Biotech Research Institute

Set-up the Labs for BT research
(Labs for in-house research, for collaboration research)

Carry out cutting edge biotech research projects

Develop more than 10 high-value industrial material candidates every year

Publish 50 SCI Papers every year

Apply & Register 20 Patents every year

More than 10 Technology Transfer every year

Road Map

2021~2023	2024~2026	2027~2030
Creating BT Industrial Ecosystem	Activate Start up in Green-biotech field	Make a Global Top 20 Green Bio Company

Establish the Start-up Development Center

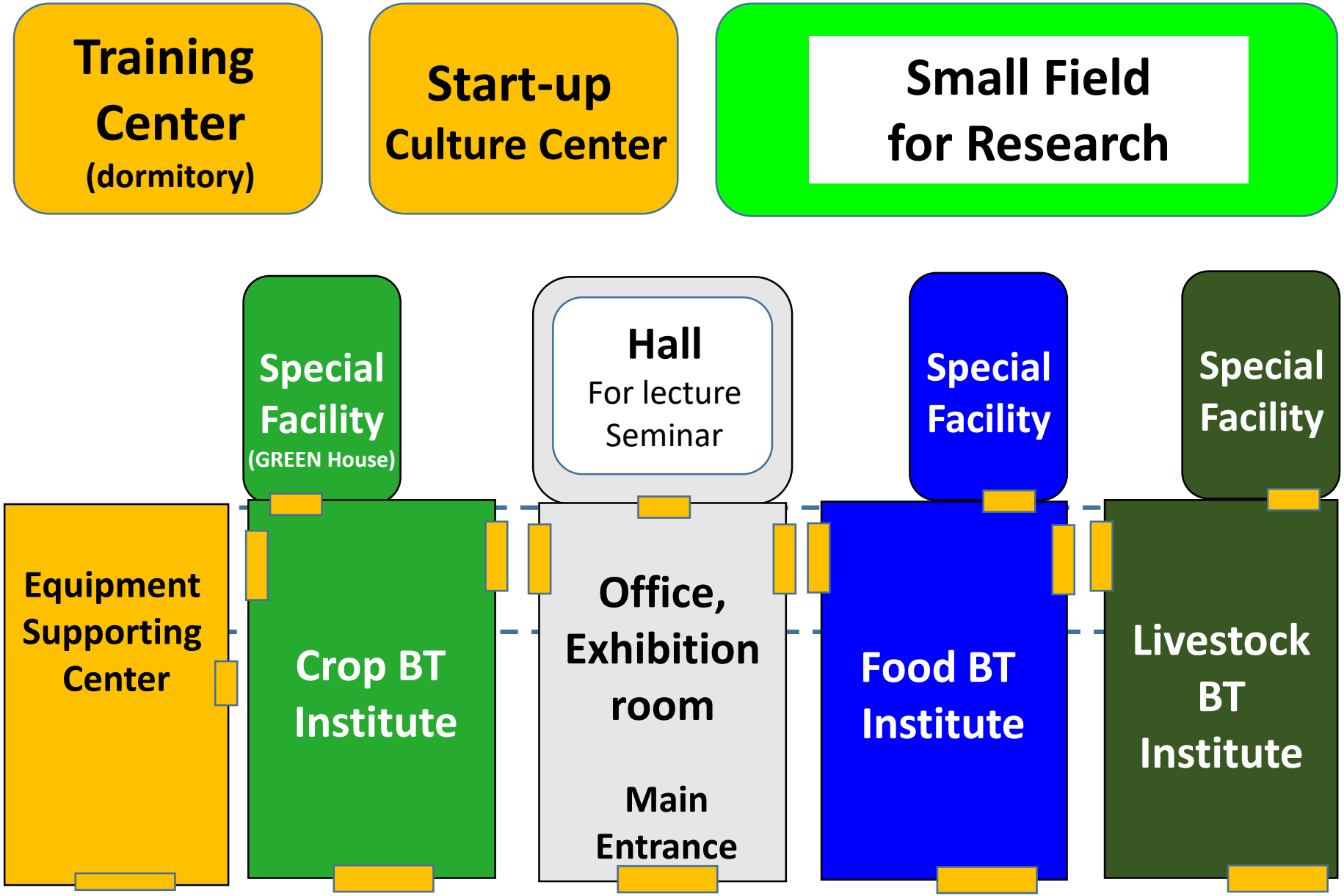
Setting up a Real-Time Service System & Actual Support in the Start-up Center
(Consulting & promoting for tech transfer, start up, business, etc.)

Establish Collaboration Labs & Joint Projects with Industry	**Develop more than 20 Start-up Companies**	**Promote Green Bio enterprise with more than $1 billion in sales**

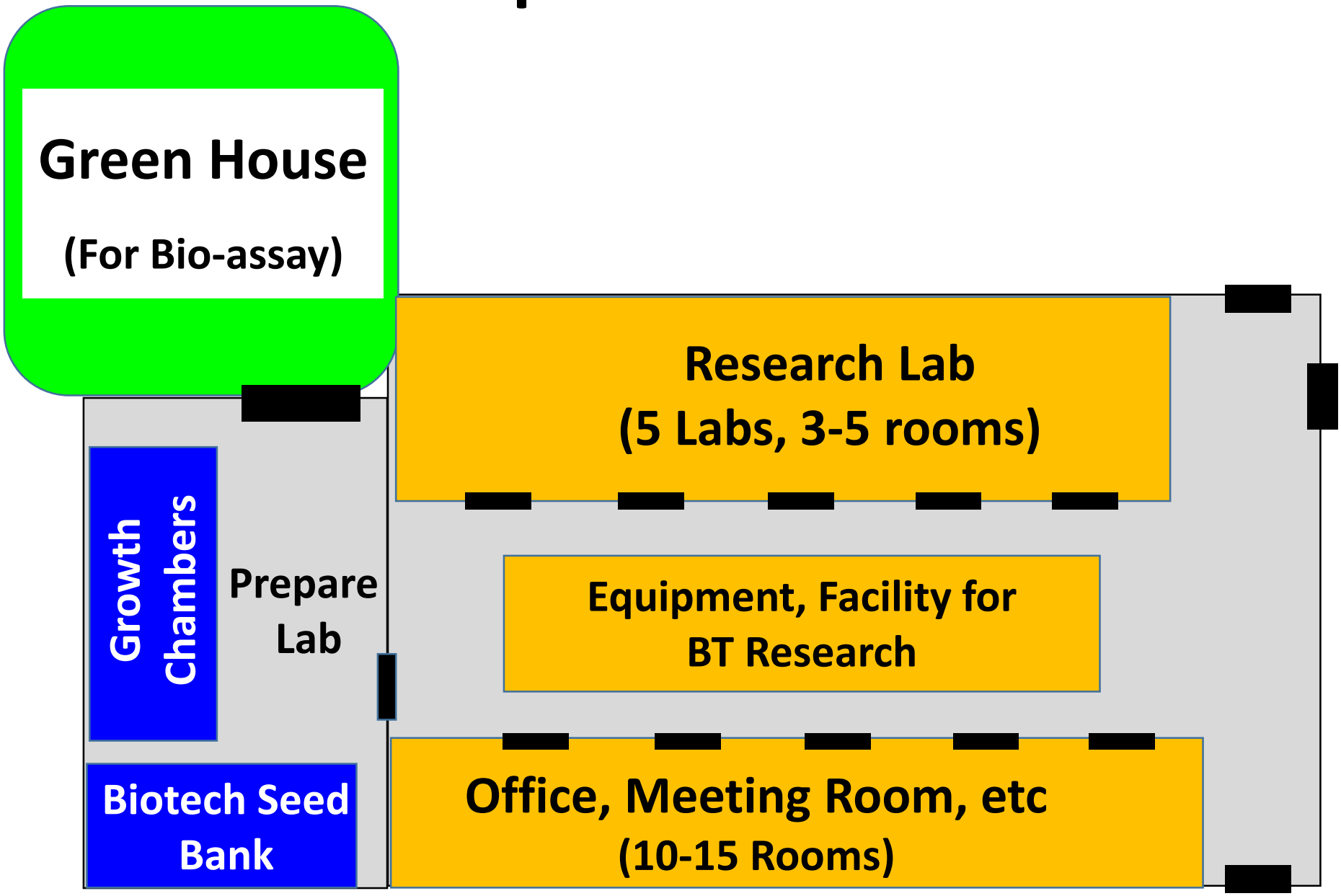
Building Concept of BT Center

Required contitions

- ✓ Should be located **near the university** for easy securing manpower and operating a joint degree program
- ✓ Should be located **near to related research institute** such as INIA for more convenient joint research and facility share
- ✓ Should consider **the possibility of further additional area needs**
- ✓ Should be **suitable to create Research-Industry Complex** such as Food Valley for contributing to regional economic development
- ✓ The **accessibility of visitors and living conditions** of staffs such as accommodation & transportation should be convenient
- ✓ Should be **no problem for livestock & biotechnology research**


Training Center (dormitory)
Start-up Culture Center
Small Field for Research
Special Facility (GREEN House)
Hall For lecture Seminar
Special Facility
Special Facility
Equipment Supporting Center
Crop BT Institute
Office, Exhibition room
Main Entrance
Food BT Institute
Livestock BT Institute

Crop BT Institute



Work Flow Chart in Detail