

Korea, a bridge between Emerging Economies and OECD

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*Leading the way into a Green Future
through National Energy Technology Innovation*



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Potentials and Challenges of Emerging Economies

Issues of Clean Energy Technology

Potentials

- **Abundant renewable energy resources**
 - PV, Biomass, Hydro Power, Wind Power, etc.
- **Implementing policies for clean energy technology**
 - Long term goals to increase utilization of renewable energy and the efficiency of energy consumption
 - Various incentives to vitalize energy industry

Challenges

- **Infrastructures for clean energy are demanded**
 - Expanding electricity grid and increasing the efficiency of off-grid
 - More investment for technology developments, as well as capacity building
- **Cultivating clean energy industry has to be prioritized**
 - Increase investment from private sectors to promote green industry
 - Detailed energy policies must be established and executed continuously

Importance of long-term Energy technology Plan

- Mid to long term energy technology plans are indispensable
 - Reflect domestic energy supply trends, and technology level
 - Identify critical energy technology fields
 - Set detailed R&D roadmap
 - Offer comprehensive plan for energy efficiency, renewable energy, and resource development



Lesson from previous Korean energy policies

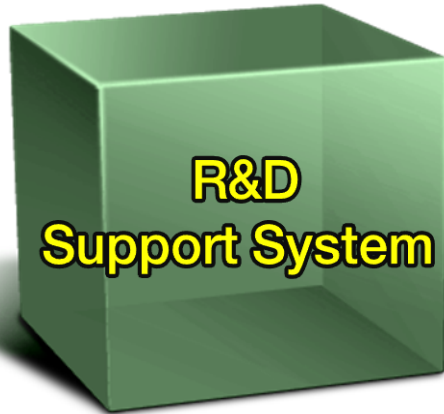
- Renewable energy technology development plan(1988), 10yrs Energy technology development plan(1997), and Resources technology development plan(2000) → **R&D investment efficiency was low due to lack of linkage among plans**

- 
- 1st National Energy Technology R&D Plan (2006), 2nd plan (2011)

The background of the slide is a photograph of a bright blue sky filled with fluffy white clouds. A semi-transparent white horizontal band is positioned across the middle of the image, serving as a backdrop for the title text.

The 2nd Energy Technology R&D Plan of Korea

What to be improved from previous energy R&D(I)



- Need to establish and strengthen the mid- to long-term Strategy / Project Planning / Outcome feedback system



- Reinforcement of the mid to long-term strategy establishment capability such as roadmap, R&D budget investment portfolio
- Establishment of systematic outcome analysis system

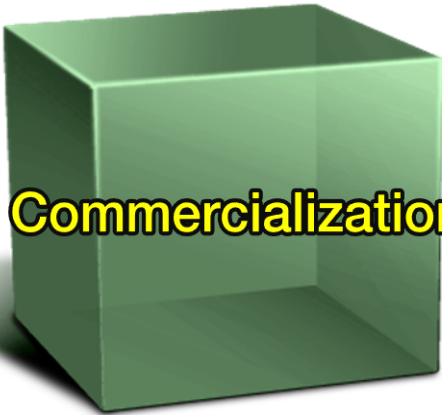


- Government support for R&D activities of large companies due to high risk of energy industry



- Necessity to build a support mechanism for win-win growth of large-medium-small companies

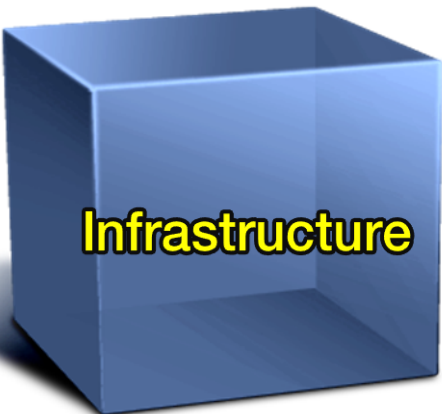
What to be improved from previous energy R&D(II)



- Insufficient outcomes in market creation compared to an increase in R&D investment



- Necessity for a strategy to take leadership in global market by securing fundamental technology and increasing investment



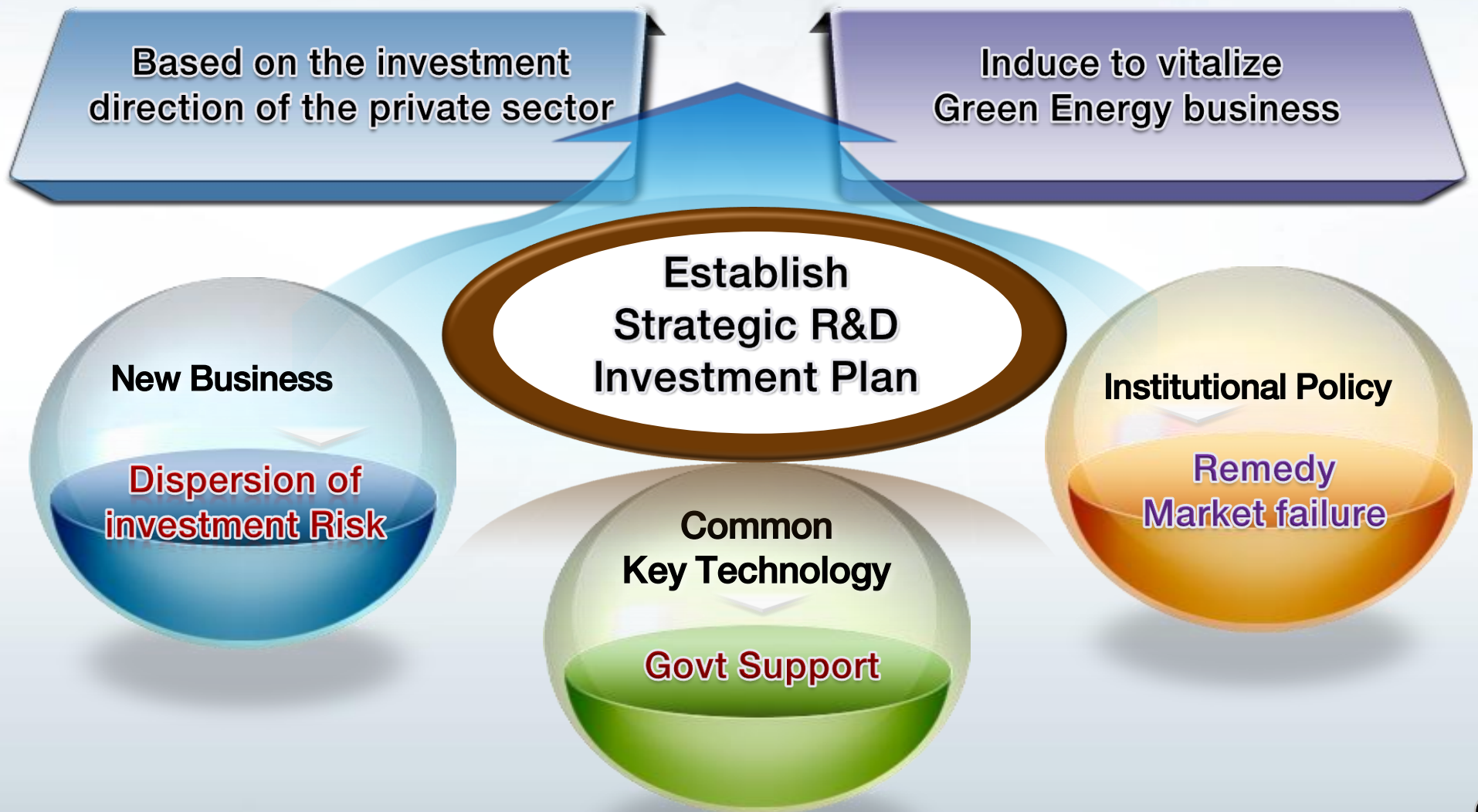
- Shortage of outstanding human resources and international collaboration strategy
- Lack of social acceptance of new energy technology



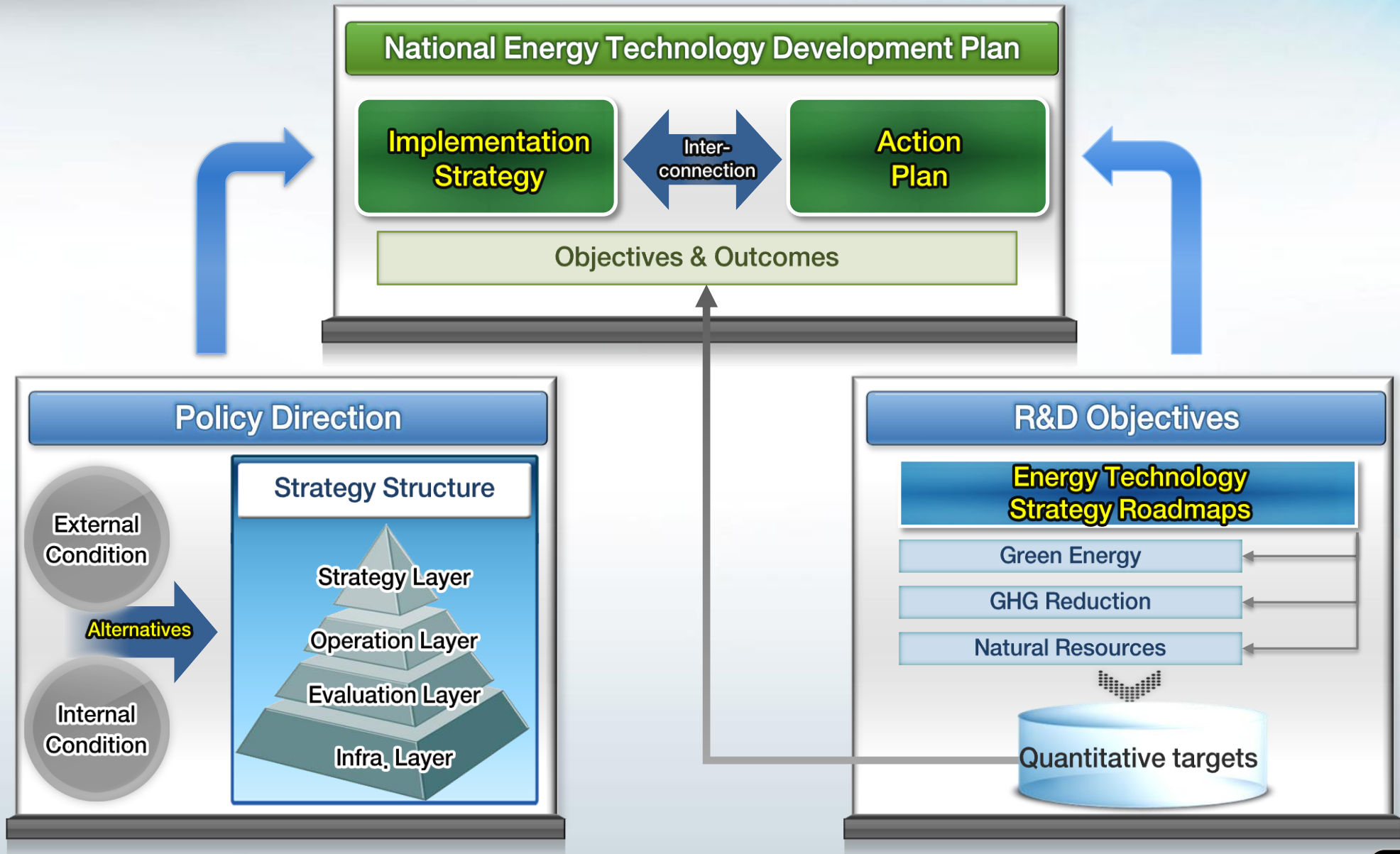
- Build customized human resources development programs and Strategic international collaboration plans
- Development of R&D programs with public acceptance

Strategic Direction

Government R&D strategy reflecting market needs



Development of National Energy Technology R&D Plan



Green Energy Strategy Roadmap 2011

Enhancing Korea's competitiveness in global green energy through technology innovation

- Promote exports and new growth in green energy industry
- Guide private sector in making investment plans for green energy technology

15 key technology fields for green energy (88 strategic items & 288 core technologies)

Supply (9)

PV, Wind Power, Fuel Cell, Biofuel, Clean fuel,
IGCC, CCS, Clean thermal power generation, Nuclear Power

Delivery (2)

Smart Grid, Energy Storage

Utilization(4)

Green Car, High-efficiency new lighting sources, Energy efficient
Buildings, Heat Pump

GHG Reduction Technology Strategy Roadmap 2011

Achieving the National Greenhouse gas reduction target through industry oriented energy technology R&D

- Selecting key technologies with potential for GHG reduction and value-added
- Develop best available technology and scenario by industry

15 key technology fields for GHG reduction (54 strategic items & 177 core technologies)

Process improvement(3)	Petrochemical process, High-Efficiency dyeing process, Non-CO ₂ processing technology
Parts advancement(2)	High efficiency home appliance, High efficiency IT device
Business model creation(3)	Unutilized energy, Co-generation system, Geothermal heat
Common equipment(7)	Next generation dryers, Combustion machines, Heat exchangers, Fluid machineries, Electric motors, Superconductivity, Energy Materials

Resources Development Technology Strategy Roadmap 2011

Enhancing energy security through attaining core technology

- Developing technology development strategies for Energy/Resources Security
- Securing resources essential to green energy industry

8 key technology fields for energy & resources development (26 strategic items & 84 core technologies)

Minerals resources(4)

Metallic minerals, Non-metallic minerals, Mineral resources exploration, Mine resources development

Oil & gas(4)

Unconventional oil, Unconventional gas, Conventional oil & gas, Oil & gas exploration

Overview of 2nd National Energy Technology R&D Plan

Goal

Seeking new growth possibilities and breakthroughs from climate change by energy technology development

Advanced R&D System

- Energy technology portfolio system
- Setting key technology indicators
- Building reflux system of outcome

Win-Win R&D

- Master plan for component, materials, equipments
- Global energy star 2050 project
- Social welfare energy R&D

Agenda & Tasks

- Mega convergence technologies
- Future energy technology project
- Fundamental technologies for natural resources development

- Convergence with social science and humanities
- International cooperation
- Human resource development

Outcome-Oriented R&D

R&D Infrastructure

Green Energy
Strategy Roadmap

GHG Reduction Technology
Strategy Roadmap

Natural Resources Development
Strategy Roadmap



Cooperation with Emerging Economies

1 MW CSP Development Project with China



- Duration of Project : 2006 ~ 2012
 - KIER [Korea Institute of Energy Research] : Heat absorber, Heat storage
 - Institute of Electrical Engineering (China) : Tower, Heliostat, Power plant

Production of carbonized solid fuel by using empty fruit bunch with Malaysia

Process of Palm Oil production



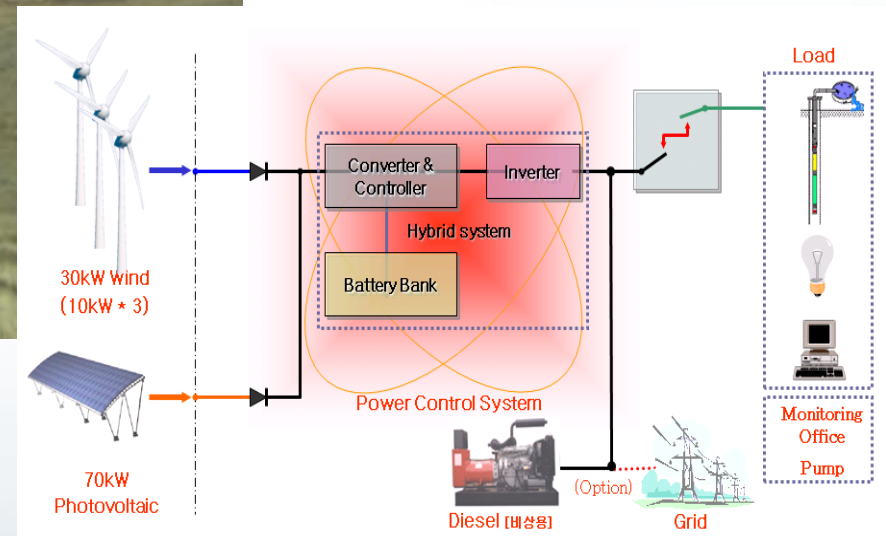
FFB



After Pellet-Molding

- Duration of Project : 2011 ~ 2014
 - CES [Korea] : Engineering carbonized solid fuel production system
 - University Putra Malaysia : System Operation, Economic feasibility analysis

Demonstration of PV-Wind turbine hybrid system with Mongolia



● Duration of Project : 2007 ~2009

- Daegu City Gas [Korea] : Installing PV, Wind Power, and Heat Pump system
- Ministry of Mineral Energy [Mongolia] : Site provision, monitoring operation

Capacity Building Program



Knowledge Exchange on Energy Efficiency

Date & Location	25-29 June 2012 Riverside Hotel, Seoul
Attendance	World Bank, Public officers from League of Arab States
Program Detail	Energy Efficiency Policy, Audit, Management, Target Management, ESCOs, Integrate Supply & DSM, EE on Buildings, Transportations, IT, Labeling program, Appliances Certificate, e-Standard Program

International Collaborative R&D Budget

- FY 2012 budget for international collaborative R&D: 20 million USD
- Funding per project : average 0,3 Million USD per year
- Project Duration : 2 ~ 3 years
- 46 projects are currently on progress

Category	On-going Projects	2012
		Budget
Energy Efficiency	<ul style="list-style-type: none"> • Energy Storage : 7 • CCS : 3 • Green Building : 6 • Efficiency : 3 • Resource : 1 • IGCC : 1 	9,9 M USD
Renewable Energy	<ul style="list-style-type: none"> • Photovoltaic : 7 • Wind Power : 3 • Fuel Cell : 1 • Bio-Energy : 2 • Hydro : 1 • Waste : 2 	6,5 M USD
Power & Grid	<ul style="list-style-type: none"> • Smart-grid : 5 	1,8 M USD
Nuclear	<ul style="list-style-type: none"> • Next-Generation & Safety : 4 	2,0 M USD

Summary

- Emerging economies have potentials and challenges in clean energy technology
- Mid to long term energy technology R&D plans are indispensable
- Experience of IEA countries on developments of Mid to long term energy technology R&D plans should be shared
- Joint R&D projects between IEA countries and emerging countries are necessary in order to nurture clean energy industry of emerging economies

Thank you



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