

East Asian Energy Efficiency Cooperation: Past and Future

Joint Research by

Central Research Institute of Electric Power Industry (CRIEPI), Tokyo

Fridtjof Nansen Institute (FNI), Oslo

Lawrence Berkeley National Laboratory (LBNL), Berkeley

University of San Francisco (USF), San Francisco

International Energy Agency (IEA), Paris

Energy Research Institute (ERI), Beijing

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Goal of the Part II

The research team, with this distinguished audience, would like to :

1. Share the findings of:
 - a) the review of energy efficiency cooperation,
 - b) stakeholder interviews in China and Japan.
2. Propose “Policy Development Fund” for discussion
3. Learn from candid opinions in the audience

1. Introduction

Taishi Sugiyama

About the Research Project

- **Goal:** examine key issues and propose ideas for further cooperation among East Asian nations on energy efficiency
- **Targets:** government, industry, NGOs, and researchers of East Asian countries
- **Context:**
 - Multiple benefits for potential parties
 - Joint research by CRIEPI, ERI, FNI, LBNL, USF
 - Part of “post-Kyoto” but regime-neutral

Timeline

- **Scoping Workshop**
 - April 2005, Tokyo
- **Interviews**
 - May-August 2005, multiple countries
- **Interim workshop**
 - September 2005, Tokyo and Beijing
 - Discuss revised draft proposals with stakeholders
- **Formal workshop**
 - February 2006, Tokyo
 - Public presentation of proposals for action
- **Final report and recommendations**
 - March 2006

About the researchers

- Central Research Institute of Electric Power Industry (CRIEPI)
 - Electric utility industry-funded research organization, Tokyo, Japan
- Energy Research Institute (ERI)
 - National research body, Beijing, China
- Fridtjof Nansen Institute (FNI)
 - Independent research body, Oslo, Norway
- Lawrence Berkeley National Laboratory (LBNL)
 - National research body, Berkeley, USA
- University of San Francisco (USF)
 - Private university, San Francisco, USA

National Priorities, Common Interests

- For most countries, priorities are:
 - > *National security, including energy security*
 - > *Economic development*
 - > *Mitigation of local pollution*
 - > *Prevention of climate change*
 - For Japan, climate change is high priority, along with energy security and a strong economy
 - For China, an efficient economy is high priority, followed by energy and pollution concerns
- **Cooperation on energy efficiency can contribute to priorities of both countries: improve energy security, prevent climate change, and realize efficient economy.**

Proposal: **POLICY DEVELOPMENT FUND for East-Asian Energy-Efficiency**

- Like-minded countries in East Asia join the independent fund. Financial contributions are voluntary. Expected initial scale \$10 million annually.
- Financially supports formulation and initial implementation of energy efficiency policy in member countries. Recipients commit themselves to implementation.
- Recipients, not donors, retain discretion over types and stringency of policy measures.

Proposal: POLICY DEVELOPMENT FUND (continued)

- CEO makes decisions, including project selection, under guidance of Executive Board. CEO is nominated by EB.
- Projects are selected by CEO using cost effectiveness as a key criteria. Cost effectiveness = energy savings or CO₂ reductions per amount of grant.
- Fund supports new projects and provides co-financing for existing efforts.

**2. Review of East Asian
Energy Efficiency Cooperation
to Date
Stephanie Ohshita**

Big Trends

- Form of Cooperation: growing importance of **Policy Development Cooperation**
 - beyond Policy Dialogue (and NOT conditionality)
 - supports host country in creating a top-down push and incentives for energy efficiency
 - leverages other gov't and private financing
- Institutional Structure: growing role of **independent, international networks**
- Sectors & Technologies: greater attention to **more distributed targets**: appliances, buildings, demand-side management

Many Existing Activities . . .

- Form of Cooperation: from large Technology Cooperation projects to small Policy Development and Technical Assistance grants.
- Institutional Structure: 4 main types of organizations: bilateral, multilateral (ADB, GEF), regional (ASEAN, APEC), and international/independent (REEEP, CLASP)
- Sectors & Technologies: Most energy efficiency cooperation activities have occurred in **Industry** and **Appliances**, with newer efforts in Demand Side Management (ESCOs), Buildings, and Transportation.

Examples of Existing Energy Efficiency Cooperation in East Asia, 1990s~present (1)

- **Industry** (Steel, Chemicals, Cement, Boilers)
 - Japan-China-SE Asia: Green Aid Plan technology demonstration in steel, chemical, cement; energy manager training
 - US-China: industrial motor standards
 - GEF-World Bank-China: industrial boilers
 - Energy Foundation (CSEP): steel sector voluntary agreements
 - GEF-UNDP-China EUEEP
 - EU-China EEP
- **Appliances**
 - CLASP-China: standards & labels(S&L) for air conditioners, washing machines, TVs, computers, etc.
 - CLASP-ASEAN-APEC: S&L coordination
 - GEF-UNDP-China: commercialization of efficient refrigerators
- **Electric Power**
 - Japan Green Aid Plan
 - ADB-China
 - EC-ASEAN Co-gen

Examples of Existing Energy Efficiency Cooperation in East Asia, 1990s~present (2)

- **Demand-side Management (ESCOs/EMCs)**
 - GEF-World Bank-China: EMCs
 - ADB-Asia: ESCO Fund
- **Buildings**
 - Energy Foundation CSEP-China
 - EU-China EEP
 - REEEP-China
- **Transportation**
 - Energy Foundation CSEP-China
 - ASEAN-Australia
- **Public Sector (Government)**
 - PePs-China
- **Financial Sector**
 - Energy Foundation CSEP-China
 - REEEP- China

... But More Cooperation Needed

- Still a **large potential for energy savings**.
- Most development cooperation and Kyoto Mechanisms do not sufficiently promote energy efficiency.
- Progress in **appliance standards and labels** can be **expanded** with higher standards and more locations.
- More activity is needed in the fast-growing **buildings** and **transportation** sectors.
- Still need innovative approaches to improve **industrial** energy efficiency.
- More activity is needed to develop financial and regulatory **incentives**.

Increasing Cooperation on Policy Development

- Large funders are using Policy Development to enhance Technology Cooperation. Examples:
 - GEF-UNDP-China: End-Use Energy Efficiency Programme (EUEEP)
 - ADB-China: Industrial Energy Efficiency & other projects
 - EU-China: Energy Efficiency Programme (EEP)
- Smaller funders are focusing on Policy Development to promote technology diffusion and energy savings. Examples:
 - Energy Foundation - China Sustainable Energy Program (CSEP): Automobile Fuel Economy Standards and many others
 - CLASP - China/ASEAN/APEC: Appliance Efficiency Standards & Labels

International Networks Leverage Needed Expertise

- Growing involvement of independent, international networks
 - CLASP: Collaborative Labeling and Standards Program
 - REEEP: Renewable Energy and Energy Efficiency Program
 - Energy Foundation CSEP: China Sustainable Energy Program
- Newer form of cooperation that emphasizes expertise, bringing together people from private sector and research institutes as well as government

Policy Development Needs Implementation Support

- Cooperation on **Policy Development** can yield **large energy savings**; e.g., appliance efficiency standards in China would displace the need for 50 x 500 MW coal-fired power plants over a 20-year period, *if fully implemented*.
- There is still a **need for cooperation** on formulating the **implementation details** of energy efficiency policies (e.g., guidance, rules, incentives). Sharing international experience can help the domestic effort.

3. Stakeholder Views - Japan and China

**Goerild Heggelund and
Taishi Sugiyama**

Japanese stakeholders interview findings

Interviewee of Japanese government and industries are:

- Generally favorable with the idea of EAEEEC,
- Understanding well that there are common national interests in energy conservation.
- Of mixed views on past activities (GAP, CDM-FS, JICA)
- Not always familiar with the concept of *policy development assistance* – or, worry if it is accepted by China.

Chinese stakeholders interview findings (I)

- Stakeholder interviews summer 2005
 - Ministries, academics, donors
- Stakeholders very positive to the proposed Fund framework
- Related the proposed Fund framework to China's national energy policy
 - NDRC's energy-conservation plan, China Medium and Long Term Energy Conservation Plan (2004-2020)
- Positive to focus on energy efficiency because of the current political attention to energy challenges
- The Fund proposal very timely – policy mood is ripe for cooperation in energy efficiency

Chinese stakeholders interview findings (II)

- Areas
 - Knowledge sharing
 - Capacity building/training
 - Policy studies and development, including implementation plans, technical assistance and legal assistance were stressed
 - Ex.: support to develop specific measures for achieving China's medium- and long-term goals for energy efficiency
- Standards and labeling
 - linked to international cooperation/trade
- Technology transfer
 - Japan and South Korea both have advanced technology that could be useful for China

Political: Multilateral or bilateral?

- Multilateral is often more complex, but.....
- ...multilateral (international fund) may have more leverage and stability
 - Bilateral easier way of cooperation
- Suggestion from stakeholders in China:
 - start as bilateral or trilateral framework at first, then move to multilateral framework
 - Trilateral involves three governments: Japan China and South Korea
- Eventually invite ASEAN countries
- Eventually extend to APEC or APEC + India.

The Fund: Possible Models Discussed with Chinese Stakeholders

- Fund placed in an existing institution could be more cost effective
 - ADB one option discussed
 - Established body of regulation and practice governing how funds from ADB are used
 - Subject to existing political environment & red tape
- BUT: Opportunity for new and independent fund
 - Funding process needs to be dynamic - existing multilateral banks often require long and many paperworks given their own goals.
 - Strong signal of political recognition for energy efficiency

Projects: Sectors and technologies

- **Industrial process technologies**, especially for building materials, steel, aluminium, and chemicals
- **Vehicle technologies** for components and systems
- **Electrical equipment**, e.g., motors, fans and motor systems like pumps, lighting, home appliances
- **Coal-burning technologies**, e.g., boilers and kilns
- **Electricity transmission** will become more important as dependence on distant hydropower grows
- **Natural gas & oil technologies**, e.g., gasification (transport from Central Asia + Russia)
- **Renewables** are important in strategic terms—but not focus of proposed activity

4. The “Policy Development Fund”: A Proposal for Discussion

Taishi Sugiyama

Requirements for a new framework

- Meet **national priorities** of participating countries
- Aim for **massive energy savings** and significant **emissions reductions** through **market transformation** and leverage of **private sector resources**
- Commit to **concrete actions** and support **policy mechanisms** for such actions

Three levels of the Fund

- a. Political Agreement
- b. Design of the Fund
- c. Projects

a. Political Agreement

- Start with multilateral agreement from the outset, to avoid capture by narrow interests, but...
- Emphasize areas of agreement, stability, alignment of interests and effective management. And so...
- Keep number of initial participants small.

Conclusion: Begin from small number of countries and expand later.

b. Design of the Fund

- There is a need for *new and dedicated fund* for energy efficiency, given long and many paper-works required for international organization established for other purposes.
- Form *independent, professional management structure* (CEO, board, staff) to insulate from short-term political changes
- Restrict activities to region and to *efficiency only* for alignment of interests and effective management

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4. Illustrative Project Examples: Success Stories and Future Opportunities

**Steve Wiel, Alan Meier,
Taishi Sugiyama and
Jonathan Sinton**

Projects: Ripe Opportunities

Buildings Sector

- Efficient technology: CFL Initiative (Lighting equipment)
- Standby losses: Set-top boxes, TVs, external power supplies
- Building energy codes
- Applications of cross-cutting approaches, e.g.:
 - Appliance and equipment standards & labeling: CLASP
 - Tax and other incentives

Industrial Sector

- Voluntary agreements with industry
- Energy management systems for system and process design assistance
- Applications of cross-cutting approaches, e.g.:
 - Industrial equipment standards
 - Tax and other incentives

Projects: Ripe Opportunities (cont'd)

Transportation Sector

- Applications of cross-cutting approaches, e.g.:
 - Efficiency labels for tires
 - Vehicle fuel economy standards & labels
 - Tax and other incentives

Crosscutting

- Standards & labeling: CLASP
- Public-sector efficiency programs, including procurement: PEPS
- Utility-based programs: demand-side management (DSM)
- Energy service companies (ESCOs)
- Incentives
 - Credits for R&D, manufacturing, purchasing
 - Equipment (catalog) and systems (design)
 - Tax reductions, accelerated depreciation, incentive payments, rebates
- Heat island mitigation

Example 1: CLASP

Steve Wiel

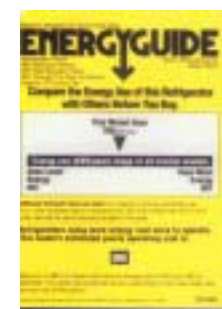
Cross-Cutting Example: Standards and Labeling

S&L = Energy Efficiency Standards and Labels

- Energy Efficiency Standards:*
are regulations that **prescribe** the **energy performance** of manufactured products, often prohibiting the sale of products less energy-efficient than the minimum standard.
- Energy Efficiency Labels:*
are informative labels affixed to manufactured products that indicate a product's energy performance and provide **purchasers** with the information necessary to make an informed **purchase-decision**.

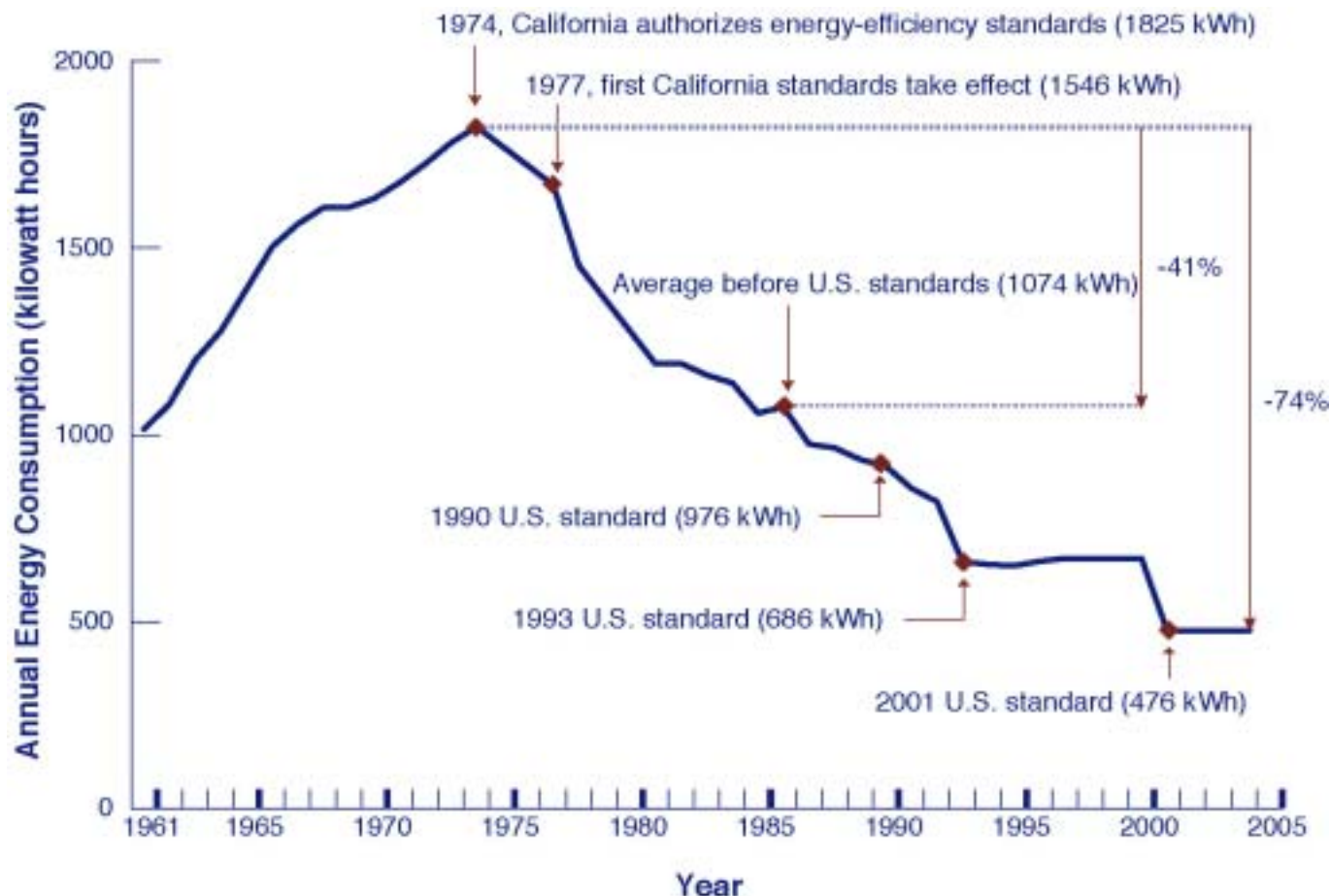


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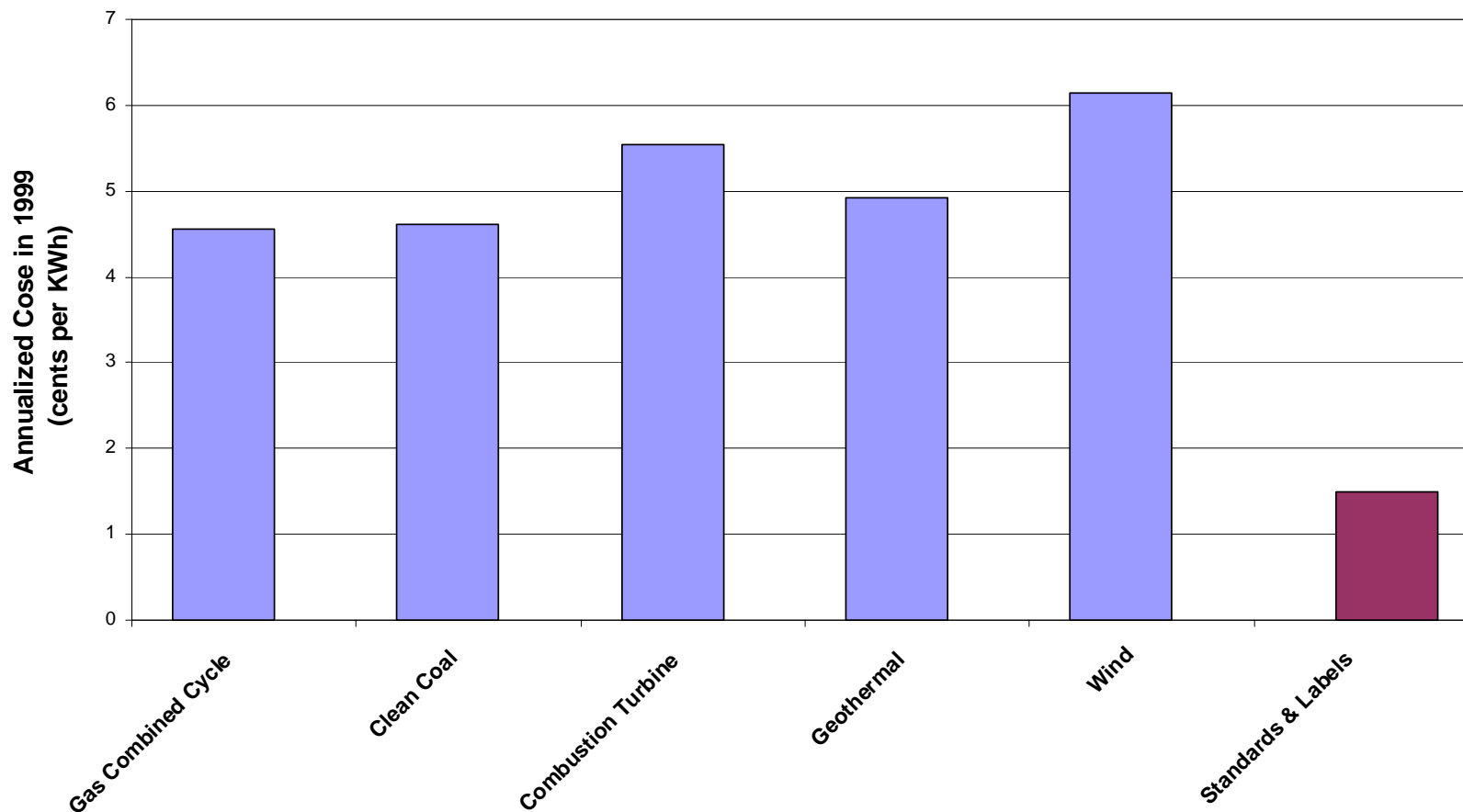
Standards Can Improve Energy Efficiency Dramatically

Average Energy Consumption of New Refrigerators in the U.S.



Investment in S&L Is Better Than Investment in Power Production

Cost of Electricity from Various New Sources



Immediate Opportunities in Standards and Labeling

- **Benchmarking** (comparison of performance specifications, test procedures, standard levels, and/or compliance)
 - CFLs (The CFL Initiative)
 - efficient tires
 - external power supplies
 - (dozens more)
- **Harmonization** of product specifications, test procedures, and/or standard levels
- Cross-border **training** (e.g., Vietnam by China)

CLASP Provides Infrastructure (Framework and Assistance)

Collaborative Labeling and Apliance Standards Program

<www.CLASPOnline.org>

CLASP Mission:

CLASP serves as the world's primary international voice and resource for energy efficiency **standards and labeling (S&L)** worldwide.

CLASP Organization:

Established in 1999 with sole mission to promote S&L

Non-Profit Corporation with 12 Directors from 8 Countries

Registered as UN Sustainable Development Partnership

Co-sponsor of APEC S&L website <www.apec-esis.org>

Provider of assistance to ASEAN labeling program

Provider of assistance to China on all aspects of S&L

Example 2: CFL

Alan Meier

Projects: Buildings & Equipment

- Energy standards & labels for buildings and appliances
 - Energy codes for buildings
 - Standby power in Chinese TVs
 - Compact Fluorescent Lights (CFLs)
 - Set-top boxes
 - External power supplies
- Government procurement policies

Example of Standards and Labels Project: The CFL Initiative

- Large electricity savings possible through use of CFLs
 - CFLs use about $\frac{1}{4}$ of the electricity of incandescent lights
 - CFL sales are low because consumers are suspicious of quality, reliability, and power savings
 - How to raise consumer confidence in CFLs?
- Solution: "Community of Practice"
 - Group of interested countries and NGOs
 - Organized by Australia
 - Other Communities of Practice have been proposed

Results: CFL Community of Practice

- Created 5 Working Groups to address confidence issues
 - Testing methodology, Performance specifications, Test facilities, Compliance mechanisms, Informing stakeholders
- Participants
 - policy makers
 - manufacturers
 - practitioners
 - researchers & academics
- First product: uniform testing method, covering performance features of self-ballasted CFLs

Example 3: Tire

Alan Meier

Projects: Transport

- Fuel economy standards for automobiles and other types of vehicles
- Efficiency labels for tires and other vehicle components

Transport Example: Energy-Efficient Tires—Background

Background

- Rolling resistance of tires is responsible for 20% of fuel consumption
 - More if tires are under-inflated
- Low-resistance tires save ~5% in auto fuel consumption
 - 10% for trucks
 - Applies to both new and replacement tires
- Several test procedures exist
 - No international test procedure to measure rolling resistance
 - Tire manufacturers do not release test results
- Auto manufacturers in USA, Europe, Japan already carefully minimize tire rolling resistance in order to achieve lowest official fuel consumption values

Tires: The Fund Pays To...

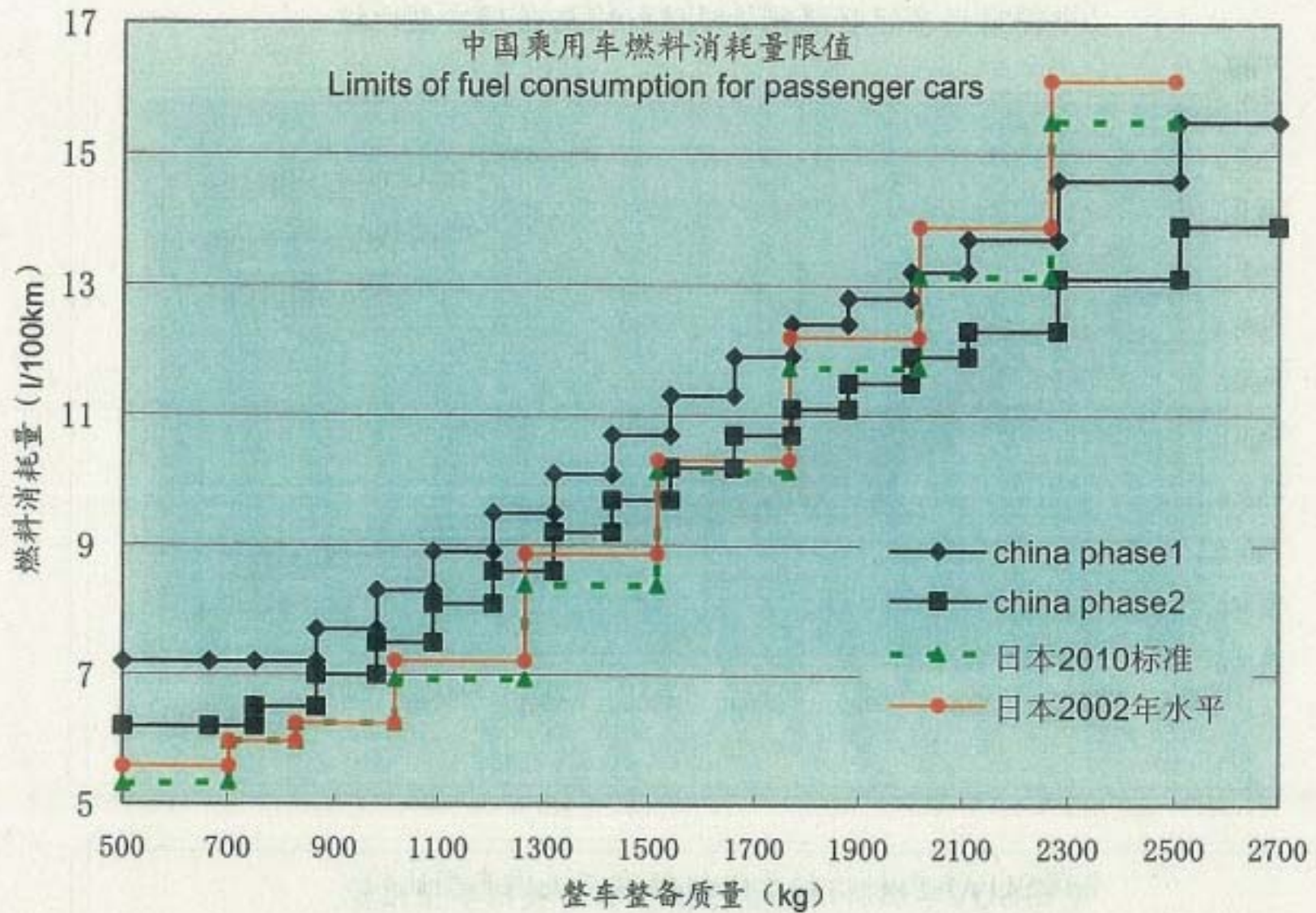
- Establish a program to label tire efficiency
 - Select measurement procedure
 - Establish testing laboratory
 - Measure rolling resistance of today's tires
 - Establish label
 - Monitor compliance
 - Help governments consider establishing a minimum standard

Example 4: Automobile Fuel Economy Standard

Taishi Sugiyama

Automobile Fuel Economy Standards

- Policy Development: the Energy Foundation supported the development of fuel economy standards
- Technical support by manufacturers
- Results: minimum efficiency standards for cars
 - In general, weaker than Japanese Top Runner, but stricter than USA CAFÉ
 - Strictest of the world for SUVs



Source: China Automotive Technology and Research Center (2003)
Research on Chinese Auto Fuel Economy Standards, Regulation and Policy

Example 5: Voluntary Agreement of Industries

Jonathan Sinton

Projects: Industry

- Voluntary agreements with industry
- Energy management systems
 - System and process design assistance
- Applications of cross-cutting approaches:
 - Industrial equipment standards
 - Tax and other incentives

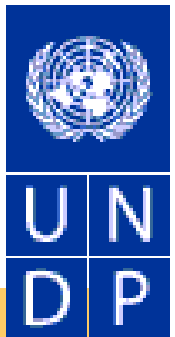
Industry: Voluntary Agreements

- Large potential payoff
- Current activity is gradually gaining attention
 - Existing pilots with 2 steel plants (Shandong)
 - Several cities signed agreements of varied nature
 - UNDP/GEF [End-Use Energy Efficiency Project](#)
 - UK [Assistance for Enterprise Covenants](#)
- Room for significant additional effort to broaden and accelerate implementation
 - [Supporting policies](#): fiscal and tax measures, technical assistance, investment
 - [Institution building](#): monitoring and assessment
- Baselines from VAs could potentially be used for calculating emission reduction credits

Industry: UNDP/GEF End-Use Energy Efficiency Project

- UNDP's *ad hoc* project-based approach was transformed into 12-year program—this is the result
- \$17 M GEF grant for Phase 1 (2005-2008)
- \$31.4 M from Chinese government
- \$32 M from Chinese private sector
- *Executing Agency*: National Development Reform Commission (NDRC)
 - with Ministry of Construction, Energy Research Institute
- \$1.5 M for industry voluntary agreements
 - 12 enterprises in steel, cement and chemicals
 - policy and institutional development

More information on EUEEP: <http://www.undp.org.cn/>



GLOBAL
ENVIRONMENT
FACILITY



中华人民共和国国家发展和改革委员会
National Development and Reform Commission

中华人民共和国建设部

Industry: UK Assistance for planned industrial program

- Input to inform China's planned **Top 1,000 Energy-Using Enterprises** initiative—monitoring and regulation of nation's largest energy users (**48% of industrial energy**)
- Regulatory program will be joint effort of:
 - NDRC
 - Office of the National Energy Leading Group
 - State Owned Assets Supervision and Administration Commission
 - National Bureau of Statistics
- UK is advising China based on its experience with *Climate Change Agreements* and *Climate Change Levy*
- Additional Support from US-based Energy Foundation
- **Other input is being sought** for this complex program



More information on UK programs: <http://www.defra.gov.uk/Environment/ccl/>

More information on Energy Foundation programs: <http://www.efchina.org/>

5. Conclusion

Taishi Sugiyama

Conclusion

Policy development assistance, with the POLICY DEVELOPMENT FUND dedicated for energy efficiency is the promising mode for further international cooperation in East Asia.

Rationale for the Policy Development Fund Proposal

1. Changing national circumstances in Asia
(More market-economy activities, economic development, less ODA, more FDI/ trade)
2. Fit well with national priorities (economic efficiency, energy security)
3. Cooperative, not coercive (cf. CO2 emission cap, oil/gas access)
4. Sector-wide coverage, cost & environmental effectiveness (cf. CDM not cover sector policy)
5. Taking advantage of existing activities
6. Well-designed incentive structure

Contact Us

Please continue sharing your ideas on energy efficiency cooperation with us.

Contact: Mr. Takahiro Ueno of CRIEPI
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Thank You!

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