ESI's Recent Work on International Unconventional Gas; and Report on World Bank Institute Workshop on the Governance of Unconventional Gas

Philip Andrews-Speed

Institute of Energy Economics Japan, 8th September 2014

Outline

1. Constraints to unconventional gas production in East Asia
2. Outlook for unconventional gas production & implications for international gas markets
3. Governance of Unconventional Gas: Exploring How to Deliver Transparent Benefits in Non-OECD Countries

1.
Constraints to unconventional gas production in East Asia

Unconventional gas

- Tight gas
- *Coal-bed methane (CBM)/coal seam gas*
- *Shale gas*
- Biogenic gas
- Methane hydrates
- *Synthetic natural gas*

China: shale gas basins

ENERGY STUDIES INSTITUTE

NUS National University of Singapore

Indonesia: coalbed methane basins

ENERGY STUDIES INSTITUTE

NUS National University of Singapore

Progress and targets

	CBM		Shale gas	
	China	Indonesia	China	Indonesia
First contracts	Early 1990s	2007	2011	2013
First production	2005	2011	2013	-
2013 production	3.0 bcm*	0.007 bcm	0.2 bcm	-
Target: 2015	16 bcm*	0.1 bcm (5 bcm^)	6.5 bcm	-
Target 2020	30 bcm*	0.25 bcm (10 bcm^)	60-100 bcm 30-50 bcm#	-

* Excludes coal mine methane
^ Earlier target – revised in March 2014.
# new target? August 2014

ENERGY STUDIES INSTITUTE

NUS National University of Singapore

Common themes: China & Indonesia

Supports	Constraints
• Very large potential reserves • Need for gas (clean cf coal) • Government rhetoric and targets • Rising gas prices • Licensing rounds • FDI opportunities	• Lack of understanding of unconventional gas • PSC processes • Pipelines: extent & 3rd party access • Land access • Overlapping resource rights (CBM) • Skills, technologies & supply chains

Weak environmental regulation

ENERGY STUDIES INSTITUTE

NUS National University of Singapore

China: themes

Supports

- NOC capacity, finance & effort
- Partnerships with international service companies (shale gas)
- Subsidies on price
- Removal of MOFTEC and MLR approvals for FDI (For CBM)
- Tax allowances
- Third party access guidance (ambiguous)

Constraints

- Complex geology>> technical challenges
- Questionable commerciality
- Shale gas:
  - NOCs occupy best acreage
  - Other license holders have little experience
  - Water shortages &/or high population densities
  - Legal ambiguities for FDI
  - Data access poor

Delegation of licensing to provinces?

Indonesia: themes

Supports

- Interest of the central government
  - Priority for CBM s 'new energy'
  - CBM roadmap
  - Commercial utilisation
  - New licensing procedures
  - New contract form (Gross PSC)
- Private sector interest (pending policy changes)
- Little social opposition (for now)

Constraints

- Policy paralysis
- Poor coordination between central & local governments
- Local communities & land owners
- High transaction costs
- Procurement regulations

ENERGY STUDIES INSTITUTE

NUS National University of Singapore

Synthetic natural gas (SNG): China

- Undergound coal gasification:
  - Numerous trials
- Above ground coal gasification:
  - Ambitious plans in N and NW China
  - 10-15 bcm/yr by 2015
  - 50-60 bcm/yr by 2020
  - Also coke oven gas to SNG
  - But:
    - Technical problems
    - Environmental costs>>? Tighter regulations

Energy Studies Institute

NUS National University of Singapore

Outlook

China

Unconventional gas production

- 2035: 150-300 bcm/yr
- For domestic use

Look out for (shale gas):

- Forced relinquishment by NOCs
- Third party access
- New licensing system
- Ramp up of Sichuan output
- Success rate outside Sichuan
- Societal resistance

Indonesia

Unconventional gas production

- 2035: < 100 bcm/yr
- For domestic use

Look out for:

- Can Jokowi deliver?
- Streamline bureaucracy
- Procurement/manufacturing
- New PSC; fiscal incentives
- Revamped licensing system
- Renewed foreign investor interest

Energy Studies Institute

NUS National University of Singapore

Journal of World Energy Law and Business (online from 10 October 2014)

Philip Andrews-Speed & Christopher Len	The Legal and Commercial Determinants of Unconventional Gas Production in East Asia
Paul Deemer & Nicholas Song	China's "Long March" to shale gas production – exciting potential and lost opportunities
Tony Regan & Zhu Chao	Twenty Five Years of Coal Bed Methane Development in China
Toby Hewitt	A progress report on Indonesian coal bed methane development
Luu Hoang Ha	Institutional and Regulatory Constraints for the Development of Unconventional Gas in Vietnam

Also: http://www.esi.nus.edu.sg/

Publications page: policy briefs and reports in progress of publication

ENERGY STUDIES INSTITUTE

NUS National University of Singapore

2.
Outlook for unconventional gas production & implications for international gas markets

Project parameters: aims

- Aims:
  - to assess the likely levels of production of unconventional gas from different parts of the world over the period to 2035.
  - to evaluate the possible impacts on global gas flows and prices.

Project parameters: structure

- Stage 1:
  - assess the likely levels of production of unconventional gas in a number of key countries and produce alternative scenarios for changes of net gas imports to or exports from these countries.
- Stage 2:
  - assess the impact of these changes on trade flows and prices in international markets by modelling.

ENERGY STUDIES INSTITUTE

NUS National University of Singapore

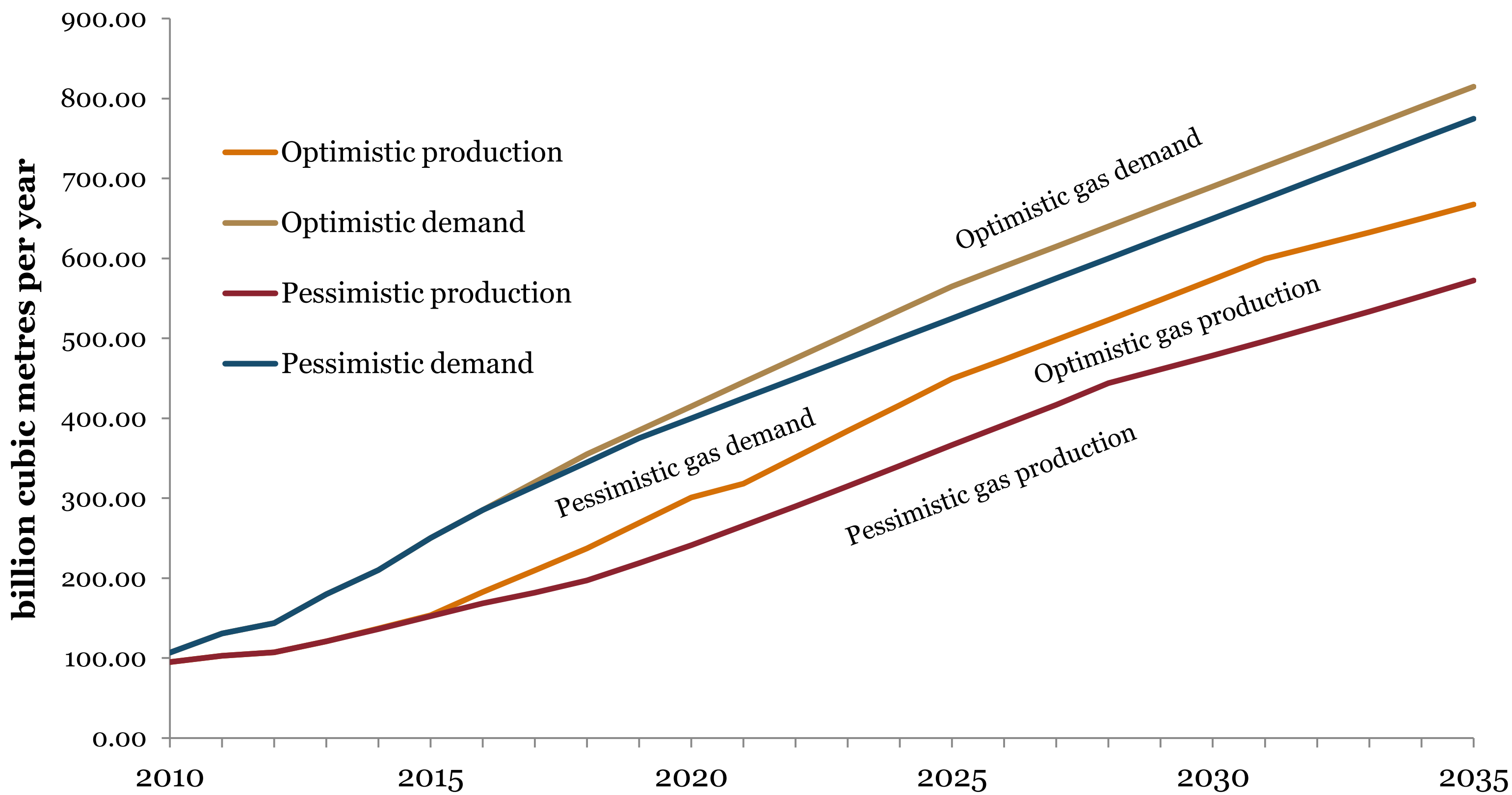
Country cases

- Asia: China, Indonesia, India
- Americas: USA, Canada, Argentina
- Europe: UK, Poland, EU
- Australia
- Plus:
  - Methane hydrates
  - Russia looks East
  - East African LNG

Key factors: US experience

Geology/ information	Favourable geology, abundant and available geological data.
Access to Land/Resource	Land owners/States own resource rights. Strong social license to operate (in places).
Rapid drilling	Technology, skills, capital, supply chains, highly competitive and open industry
Economic incentives	Mature gas market, pipelines, tax incentives, NGLs for petrochemicals
Regulatory framework	States issues water/environmental permits. Loose regulations for fracking. Third party access Low transaction costs

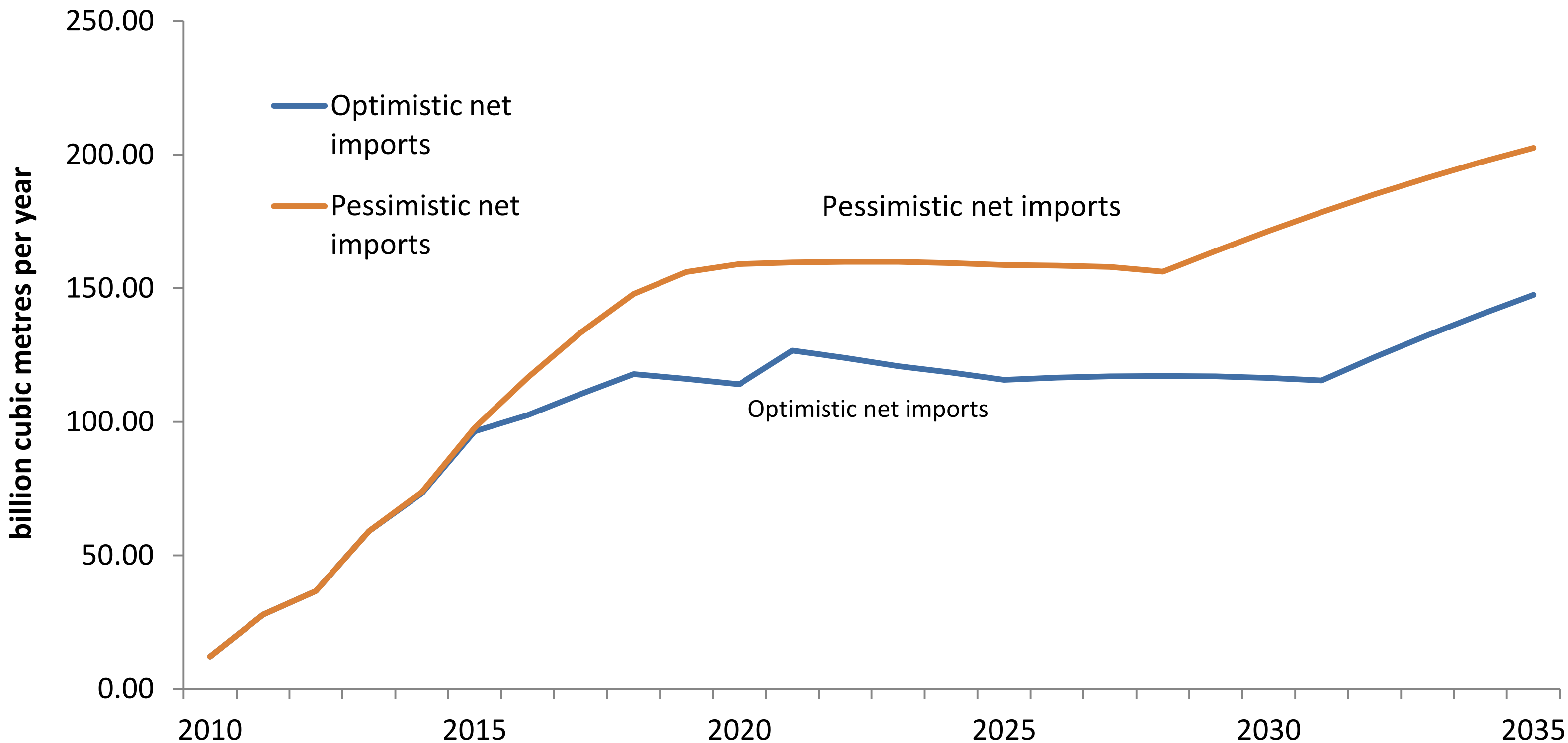
China Scenarios for gas demand and production (2010-2035)



ENERGY STUDIES INSTITUTE

NUS National University of Singapore

China Scenarios for net gas imports (2010-2035)



Findings from country case studies

- Above ground factors very important, but variable
- New importers with growing demand:
  - Domestic consumption rises, net imports may not decline (China, India, Argentina)
- Net exporters with rapidly growing demand:
  - Net exports may not increase (Indonesia)
- Net exporters with slowly growing demand:
  - Export growth depends on infrastructure (Aust., Canada)
- Methane Hydrates
- East Africa

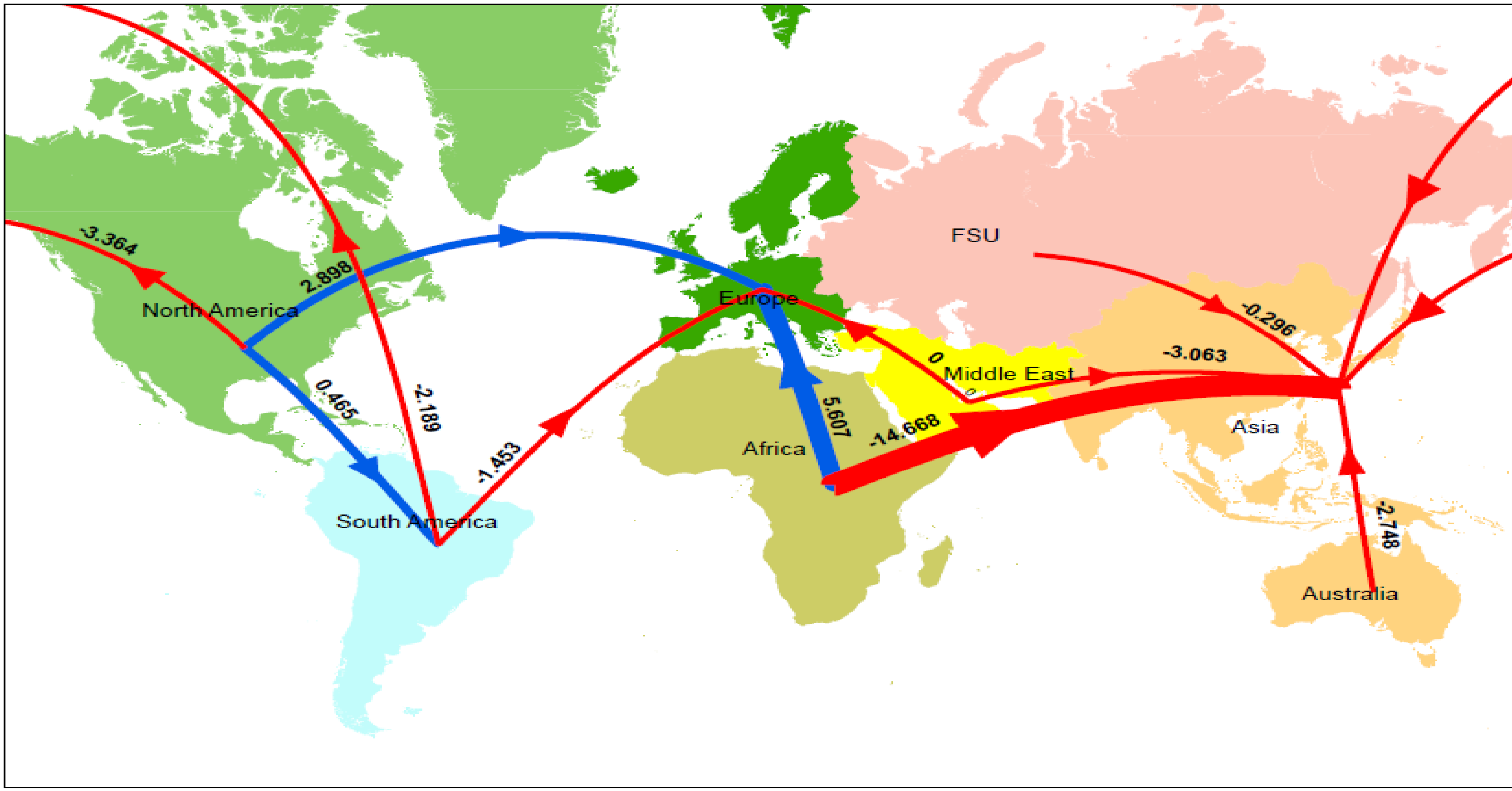
Energy Studies Institute

NUS National University of Singapore

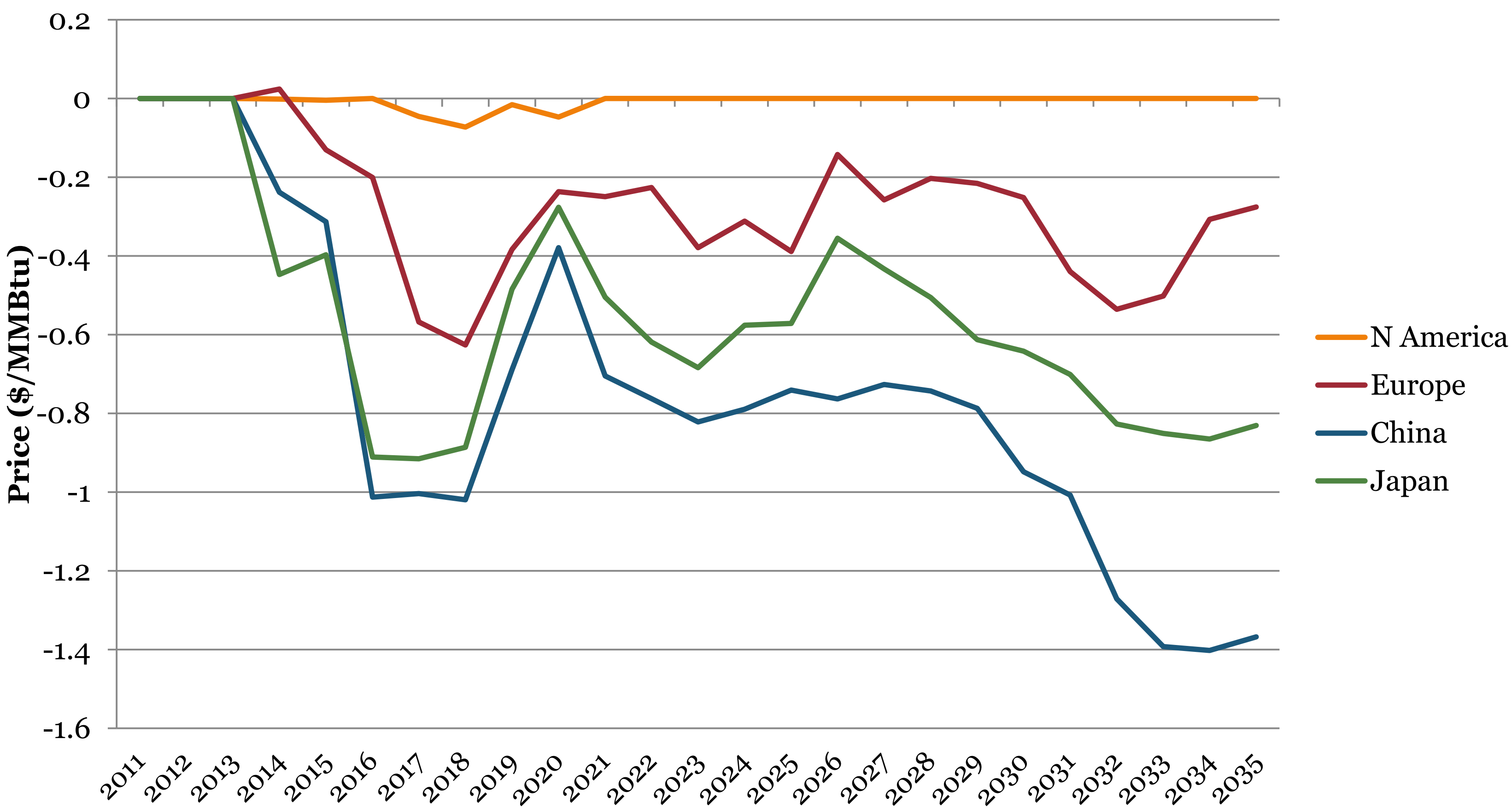
Nexant World Gas Model

- Australia: high and low
- North America: high and low
- East Africa LNG: high and low
- Global: high and low

Differences in LNG Trading Flows between High Case and Low Case (in bcm), 2035



Difference in spot prices between the High and Low Cases, 2011 – 2035



Energy Studies Institute

NUS National University of Singapore

Main findings

- Trade flows:
  - Impacts on flows of spot traded gas
- Prices:
  - Possible lower spot prices in East Asia & Europe
  - This would put downward pressure on contract prices
- But impact of "Black Swan" events could easily overwhelm these changes.

3.
Towards a roadmap for governance of unconventional gas: A multidimensional challenge

World Bank Institute Workshop

- *Governance of Unconventional Gas: Exploring How to Deliver Transparent Benefits in Non-OECD Countries*,
- Washington DC, 2-3 June, 2014.
- Drawing on papers in: OGEL Special Issue on the "Governance of unconventional gas outside the USA"

World Bank Institute Workshop

- Aim:
  - "To build common understanding of the current status of unconventional gas development in new producer countries and governance implications".
  - 16 presentations
  - Drawing on total of 22 papers from OGEL:
    - www.ogel.org

World Bank Institute Workshop

- Recognize that Unconventional Gas is Different, Treat it as Such.
- Context Matters.
- Take the Time to Get it Right.
- Information Access and Integrity.
- Explore the Potential for Consolidated Guidance on the 'How To.'
- Facilitate Ongoing Knowledge Exchange.

Contact : report@tky.ieej.or.jp