Session 4: Role of Policy Makers and Regulators in ICT & Climate Change

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Objectives

To introduce the role of policy makers and regulators related to ICT and climate change and the key regulatory issues they are dealing with:

• The functions of regulators in the Telecommunications and Energy sectors.
• An overview of regulatory activities and trends in the ICT and Energy sectors.
• Emerging issues for regulators due to the role ICTs can play in tackling climate change.

Session Topics

• Role of policy makers (e.g. Ministry of ICT, Ministry of Energy, others)
• Role of regulators (e.g. FCC and FERC (US), Ofcom and Ofgem (UK)).
• Other relevant organisations including Environmental Protection Agencies (EPAs), GeSI and GSMA.
• Case study: How has regulatory environment in the EU led to lower GHG emissions?

Remember: In order to keep average global temperature rises to below 2°C

• We have to limit GHGs in atmosphere to peak well below 500 ppm CO₂e.
• We have to reduce annual GHG emissions to well below current levels of ~50 GtCO₂e.
• We have to commit to steadily reducing GHG emissions globally:
  • to 20 GtCO₂e by 2050,
  • zero net emissions by 2100.
• We have to introduce low energy (green) technologies as soon as possible.

To start: The role of National policy makers

Policy making at National level

• Parliaments, Presidential Orders, Ministries, Cabinet Decisions provide broad policy guidelines on the vision and strategic direction keeping in view the national priorities and international obligations.
• These policy objectives are implemented through legislations, regulations, agreements, cross-sector committees, guidelines etc.
**Policies and Legislation at National Level**

Ministries are the highest level national authorities in this domain. They provide policy guidance and national directions, and are responsible for policy development and implementation at the national level. Examples of Ministries involved are:

1. Ministry of the Environment and Natural Resources (leads the climate change agenda at the national level)

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**National Policy Domain: Agencies**

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**Policy issues to consider (1)**

- Nationwide affordable high speed broadband: Accelerate the roll-out of ubiquitous high speed broadband so that e-services can be rolled out effectively.
- Promote and adopt energy efficient practices (e.g. infrastructure sharing, government adoption, smart buildings, transport, procurement).
- Create enabling environment to promote research and energy efficient ICT innovations
- Energy efficient devices and energy sources: Developing and using more energy-efficient ICT devices, applications and networks, as well as green energy sources,
- Integrate in other national plans and cross-sector collaboration: Integrate the use of telecommunications/ICTs as an enabling tool in national adaptation and mitigation plan.

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**Policy issues to consider (2)**

- Sensing and monitoring: Remote sensing (active and passive) for environmental observation support climate and water resource monitoring, disaster prediction, alerting and response.
- Measurement and KPIs: incorporate the environmental indicators, conditions and standards into their national telecommunications/ICT plans.
- Green ICT Standards: Adopt and encourage Green ICT standards to tackle environmental challenges such as climate-change adaptation and mitigation, as well as e-waste, and to promote smart sustainable cities,
- Awareness and Capacity building

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Next: The role of National regulators

The role of Regulators

- National telecoms regulatory authorities, e.g. IDA (Singapore), NBTC (Thailand), FCC (US), Ofcom (UK).
- National power regulatory authorities, e.g. EGAT (Thailand), Ofgem (UK), FERC (US).
- Impact of regulatory obligations, targets and KPIs
  - How should regulators use KPIs and targets effectively?

National Policy Domain: Regulators

National-level Regulators are agencies which undertake functions aimed at promoting infrastructure investment, penetration and accessibility in their targeted sector/segment e.g. telecommunications, power.

- National Regulatory Agency for Telecommunications
- National Power/Electricity Regulators

Regulators in Energy and Telecommunications (examples)

Energy
- CERC (India)
- ERC (Thailand)
- FERC (US)
- NEPRA (Pakistan)
- Ofgem (UK)
- SERC (China)
- DG Energy (EU)

Telecommunications
- ACOM (Australia)
- ANATEL (Brazil)
- ARCEP (France)
- BNA (Germany)
- CONATEL (Ecuador)
- FCC (US)
- NBTC (Thailand)
- NTA (Nepal)
- NICTA (PNG)
- Ofcom (UK)
- PTA (Pakistan)
- TRAI (India)

Duties of Regulators

Example: Ofcom

- Responsible for regulation of:
  - TV and radio sectors,
  - fixed line telecoms,
  - mobiles,
  - airwaves over which wireless devices operate.
- Ensures that:
  - customers get the best from their communications services,
  - are protected from scams and sharp practices,
  - while ensuring that competition can thrive.
- Encourages mobile network operators to share masts and/or sites where possible (without setting targets).
- Promotes spectrum sharing and technology neutrality.
- Ensures equivalence of access to OLOs through splitting of Openreach from rest of BT.

Example: PTA (Pakistan)

- Responsible for:
  - establishment, operation and maintenance of telecommunications,
  - applications for use of radio frequency spectrum,
  - promoting interests of users of telecommunication services,
  - promoting availability of wide range of high quality, efficient, cost effective and competitive telecommunication services throughout Pakistan,
  - promoting rapid modernisation of telecommunication systems and telecommunication services,
  - investigating and adjudicating on complaints against licensees arising out of alleged contraventions of provisions of Telephones Act,
  - making recommendations to Federal Government on policies with respect to international telecommunications,
  - provision of support in international meetings and agreements to be executed in relation to the routing of international traffic and accounting settlements.

- Ensures:
  - rights of licensees are duly protected,
  - decisions and determinations are made promptly, in an open, equitable, non-discriminatory and transparent manner.

Types of Indicators: Mobile Networks

Measure mobile network energy performance by country and by network:

- Energy per mobile connection.
- Energy per unit mobile traffic.
- Energy per cell site.
- Energy per unit mobile revenue.

Encouraging Community Energy Projects

- Community Energy projects are funded partly or wholly by the local community. Benefits flow to local community.
- In (e.g.) Pakistan there are many examples of communities wanting to generate their own power using solar PV, which is leading to the setting up of small scale enterprises.
- Given sufficient encouragement and funding these could provide at least 10% of Pakistan’s electricity in the future.
- Also, electricity so generated is mostly used by the community where it is generated – avoids construction of new high voltage transmission lines to transport electricity between towns and villages.
- Community energy schemes can provide a large proportion of the power needed to fill the energy gap.
- Policy makers and regulators in the energy sector should encourage creation of community organisations to grow proportion of renewable energy and reduce overall GHG emissions.


Internal benchmarking, before normalisation

- Spread of energy per connection across countries can be high.
- Deviation from average electrical and diesel usage, per connection.

Internal benchmarking, after normalisation

- Normalisation (against 4 variables) shows a truer picture.

What could Energy regulators do?

- Encourage a reduction in overall energy consumption.
- Encourage a switch away from fossil fuels.
- Encourage introduction of carbon-free sources of power generation:
  - Nuclear
  - Renewables
- Enable other sectors (e.g. Transport) to reduce their GHG emissions.
Infrastructure sharing to be energy efficient

- Passive component sharing (examples)
  - Sharing ducts, towers and associated infrastructure;
  - Third party ownership;
  - Renewable resources;
- Active component sharing (examples)
  - Mobile equipment
  - Data Centres
  - Sensor networks / IoTs
- MVNO
- Roaming (examples)
  - Intra cell and inter cell

Infrastructure sharing: International practices

Case study (Indonesia): In Indonesia, the regulator, Kominfo, has restricted the construction of new towers in the vicinity of an existing tower in order to persuade operators to undertake infrastructure sharing. Under the terms of the regulation, a new tower can only be constructed if for some reason the existing tower cannot be shared. The regulation provides a guideline for the construction and development of joint mobile towers. Under the regulation, the owner of a mobile tower is required to give non-discriminatory access to other telecommunications operators. The tower owners are also required to give information in terms of the tower capacity to potential access seekers in a transparent manner.

Case study (France): In France, the regulator has mandated network sharing in respect of re-building wiring. This has resulted in operators that install in-building wiring to grant a passive access to other operators at the concentration point. Under the French RLab model, one operator signs a contract with the co-owners of a building and becomes the operator of the building. This operator is in charge of the construction and the maintenance of the network within the building, and offers passive access, either through a dedicated fibre line or through a shared fibre line, to other members of the co-investment agreement. Access is granted through long-term 30-year (or 20-year) cooperation agreements (granting of the RLab).

Infrastructure sharing regulation: trends and practices

What could Telecoms/ICT regulators do?

- Encourage a reduction in overall energy consumption.
- Encourage introduction of renewables to power ICT equipment.
- Enable other sectors to reduce their GHG emissions:
  - Encourage introduction of renewables to power ICT equipment.
  - Roll out a high speed broadband infrastructure to enable growth in e-services.

Regulatory Approaches to RET

- Set a target for the % of BTS using renewable energy by 2020.
- Request figures from mobile TSPs providing “average power originating from fossil fuels per customer connected” to assess and compare progress on energy efficiency:
  - would encourage use of renewable energy resources,
  - would need to estimate % of fossil fuels in grid-supplied electricity if BTS takes power from grid for part of day.
  - would need to apportion power used by TSPs at shared sites.
- Permit different BTS site sharing tariffs to be levied when renewable or battery power is provided.

Next: The benefits of cooperation between policy makers and regulators
Policy Maker and Regulator cooperation

Energy Efficient Singapore: Collaboration amongst multiple agencies

Greening Government: ICT Strategy (UK)

Example: India - Approach to Green Telecommunications

- At least 50% of rural towers and 20% of urban towers are to be powered by hybrid power (RET + Grid) by 2015
- At least 75% of rural towers and 33% of urban towers are to be powered by hybrid power (RET + Grid) by 2020
- The TSPs should aim at GHG reduction targets for the mobile networks of:
  - 8% by the year 2014-2015
  - 12% by the year 2016-2017
  - 17% by the year 2018-2019
- All telecom products, equipment and service ....... "Green Passport"
- Declaration of carbon footprint by service providers
- Service provider should evolve carbon credit policy
- Voluntary code of practice
- E.g. install energy efficient radio networks, endeavour to achieve that Total power consumption of each BTS should not exceed 500W by 2020, phased program to have cell sites, esp in rural areas, through hybrid renewable sources.

Regulatory issues

- Incorporate energy efficiency as a regulatory strategy.
- Consider regulatory areas (sample)
  - Licensing framework to facilitate innovation and energy efficient networks and services
  - Competition: Balance between competition and consolidation
  - Quality of Service
  - Spectrum availability to support energy efficiency
  - Type approvals and adoption of green standards
  - Guidelines (e.g. Green data center)
  - Coordinate with other sector regulators
  - Interoperability to improve economies of scale
  - Infrastructure sharing to reduce energy consumption / GHG emissions
  - Measurements and monitoring

Next: National Policy Leadership Case Study
National Policy Leadership: Australia

“One of our National Digital Economy Strategy goals is to be better able to use our infrastructure and environment. High-speed broadband can help to improve Australia’s environmental sustainability by supporting smart technology applications that encourage more efficient use and demand management of water, energy, transport and infrastructure.”

The Australian government has taken a lead in integrating climate change and ICT policies by implementing an ICT sustainability plan to assist in lowering its carbon footprint. Government ICT operations are estimated to be able to improve its energy management up to 20 per cent on current consumption levels by mid-2020. This equates around 325,000 tons of carbon emissions mitigated over the five year plan.

Stephen Conroy, Former Minister for Broadband, Communications and the Digital Economy and Minister Assisting the Prime Minister on Digital Productivity.


National Policy Leadership: Australia

A hallmark of the Australian approach has been trans-sector cooperation, to extend the benefits of broadband (for which Australia is one of the top 10 economies in the world) to other sectors of the economy, such as environmental protection. In the words of Stephen Conroy, Minister for Broadband, Communications and the Digital Economy and Minister Assisting the Prime Minister on Digital Productivity:

“Across all levels of government, collaboration is necessary to tackle climate change. The Government is committed to ensuring that all stakeholders are aware of initiatives that are underway and of their value. It has adopted a whole-of-government strategy to address climate change via the ICT Sustainability Plan and its environmental goal within the National Digital Economy Strategy.”


National Policy Leadership: Australia

- In 2009 the government announced a Mandatory Renewable Energy Target of 40,000 MW (10% of its electricity supply) to come from renewable energy sources by 2020. The Clean Energy Future legislation committed to cutting carbon emissions by at least 5% compared with 2000 levels by 2020, and 80% below 2000 levels by 2050.
- Smart grid policy was deemed integral to this energy strategy. The National Framework for Energy Efficiency included developing standards, and tackling regulatory hurdles to enable adoption of smart grid technologies.
- With broad, multi-stakeholder consultation, the government kick-started an AUD27.5 billion (USD27.5 billion) in a high-speed, wholesale-only, open-access network to reach 93% of Australian premises by 2021 with fibre to the premises technology, with the remaining 7% to be connected with next generation fixed wireless and satellite technologies.


National Policy Leadership: Australia

- The National Broadband Network (NBN) was identified as a significant potential platform for future smart grid implementation in Australia.
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National Policy Leadership: Australia

The NBN underpins the National Digital Economy Strategy which sets eight Digital Economy Goals, two of which target climate change:
1) to extend national access to smart technology by 2020 to better manage energy use; and
2) double the legal capacity to at least 12 percent of Australian employees. The NBN can enable more Australians to telework more quickly.

Access Economics has estimated that if 10% of Australian employees were to telework 50% of the time, total annual gains of AUD1.1 billion (USD1.1 billion) could be delivered, including savings of 120 million litres of fuel.


Next: Case study on EU DG Energy
DG Energy (EU)

- Responsible for:
  - creating a competitive internal energy market to lower prices,
  - developing renewable energy sources,
  - reducing energy dependence,
  - reducing energy consumption.
- Sets targets for:
  - reduction in energy consumption (from 1990 baseline),
  - % of renewable energy that must be introduced.

How has the regulatory environment in the EU led to lower GHG emissions?

- DG Energy has clear mandate (based on Lisbon Treaty) to create a fully integrated competitive European energy market.
- In January 2014, EU agreed:
  - a 40% emissions reduction target by 2030 compared to 1990 levels,
  - a 27% renewable energy target,
  - most ambitious of any region in the world, expected to create 70,000 full-time jobs and cut €33bn in fossil fuel imports.
- How is DG Energy achieving this?

EU principles of a low carbon economy

- Cut of at least 20% in emissions from all primary energy sources by 2020, while pushing for international agreement aimed at achieving 30% cut by all developed nations by 2020.
- Cut of up to 90% in carbon emissions from primary energy sources by 2050.
- Minimum target of 10% for use of biofuels by 2020.
- Minimum 10% electricity interconnection target for all member states by 2020.
- Energy supply and generation activities of energy companies to be ‘unbundled’ from their distribution networks.
- Improve energy relations with EU’s neighbours, including Russia.
- Development of European Strategic Energy Technology Plan:
  - 1) to develop renewable energy, energy conservation, low-energy buildings, 4th generation nuclear reactor, clean coal and carbon capture.
  - 2) Develop an Africa-Europe Energy partnership:
     - to help Africa ‘leap-frog’ to low-carbon technologies and to help develop the continent as a sustainable energy supplier.

Summary

- A wide range of policy makers and regulators exist with different roles.
- There are a range of policy issues related to ICT & CC that should be considered at National and regional level.
- Regulators should use more instruments and take a more active role in reducing energy consumption in telecoms networks.
- Regulators should cooperate to achieve goals.

References for further reading:

Reference documents from ITU:
- ITU Global Symposium for Regulators: www.itu.int/ITU-D/treg/Events/Seminars/GSR/
- ITU World Telecommunication/ICT Indicators database

Other sources:
- (EU) Energy for a Changing World: www.managenergy.net/resources/881#.VfCkjun87A0