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**The challenges of the changes in  
the electricity supply industry.  
NEPAL, November 2018**



# **New global developments**

- **Deregulation of the electricity supply industry**
- **Renewables are competing with traditional energy sources;**
- **New technology; batteries and bulbs**
- **Climate changes create global problems**
- **New financing models from China**
- **Rapid electrification in emerging economies**
- **Need of management skills to meet the new challenges.**

**The major challenges of electricity supply industry  
are closely linked to good management, good  
governance structure and flexibility**

- **What was good management yesterday is most likely not good enough today**
- **What is good management today is definitely not sufficient to be good management tomorrow.**
- **Why: Because of the fast global changes in the electricity supply industry, we are all facing new challenges.**

# **The present global trend**

- **Deregulation of the electricity supply industry**
- **Private funding of new projects**
- **A strong environmental concern**
- **Electricity is becoming a commodity based on competition in a market.**
- **Export and import of electricity will be increasingly more important**

# **Basic requirements for success**

- **Legal and regulatory framework**
- **An efficient public administration and administrative procedures**
- **General understanding and acceptance by the stakeholders in the ESI**

# **Particular challenges in Nepal**

- **Ongoing deregulation of ESI**
- **Land acquisition**
- **Shares distributed to locals etc.**
- **Legal framework**
- **Power export / import - power exchange**
- **Delays – related to the sponsors and contractors**
- **Transmission and distribution network**

# The experience with large hydro power projects in Nepal

- **Arun 3**
- **Kali Gandaki**
- **West Seti**
- **Budi Gandaki**
- **Upper Karnali**
- **Dhalkebar transmission line**

# **The link between management of:**

- **Public administration**
- **Project Management**
- **Operation and Maintenance**
- **Transmission (System Operation)**
- **Distribution**



# Different options for generation

**Hydro power projects**

**Coal**

**Heavy Fuel Oil (gas)**

**Diesel aggregates**

**Renewables, - solar, wind and biomass**

## It is necessary to make a distinction between:

- **Small size hydro power projects**
- **Medium to large size hydro power projects**
- **Run-of-river schemes**
- **Water reservoirs**

**Multipurpose projects**

# Basic requirements

- **Access to a feasible project, related to**
  - **Environment**
  - **Technology**
  - **Economy**

**and**

**Access to:**

- Sponsors**
- Lenders**

# Supply quality of different energy sources related to peak load and base load

- **Hydropower** (dependence on hydrology)
  - Run-of-river schemes
  - Water reservoir
- **Thermal Power Plants** (storage, transport and costs)
  - HFO (Heavy Fuel Oil)
  - Coal
  - Gas
  - Diesel
- **Renewables**
  - Wind (dependence on subsidies)
  - Solar (dependence on other supplies/grid)
  - Biomass
- **Battery technology**

# Interaction between different producers

- **The need of flexibility using the difference between different sources of energy:**
  - **Hydropower – with a reservoir**
  - **Hydropower – pump-storage**
  - **Renewables ; like wind and solar energy (including run-of-river hydropower generation.**
  - **Thermal power plants (coal, oil and diesel)**
  - **Spinning-reserves/ regulating power**

## **Need of support from:**

- a) The Government (eventually the local Government)**
- b) The local community – where the project will be constructed**



**General  
observations**

# **The international trend**

- a) Deregulation**
- b) Unbundling**
- c) Competition**
- d) Privatization**
- e) TPA ( CC)**
- f) Transparency**
- g) Strengthen of legal framework**
- h) "Slimming down" the staffing**
- i) More efficient public administration**
- j) Electricity will be handled as any other commodity – and in the future it will be traded in power exchanges.**



## However, no global **standard** solution is available

- **Basic principles like unbundling and competition should be considered, but it is not advisable to import any package solution from abroad. What may be an excellent solution for instance from Norway or Germany, will not necessarily be a good solution in your country. Accordingly application of the international trend must be accommodated to meet local needs, as well as local political programs and local culture and traditions.**

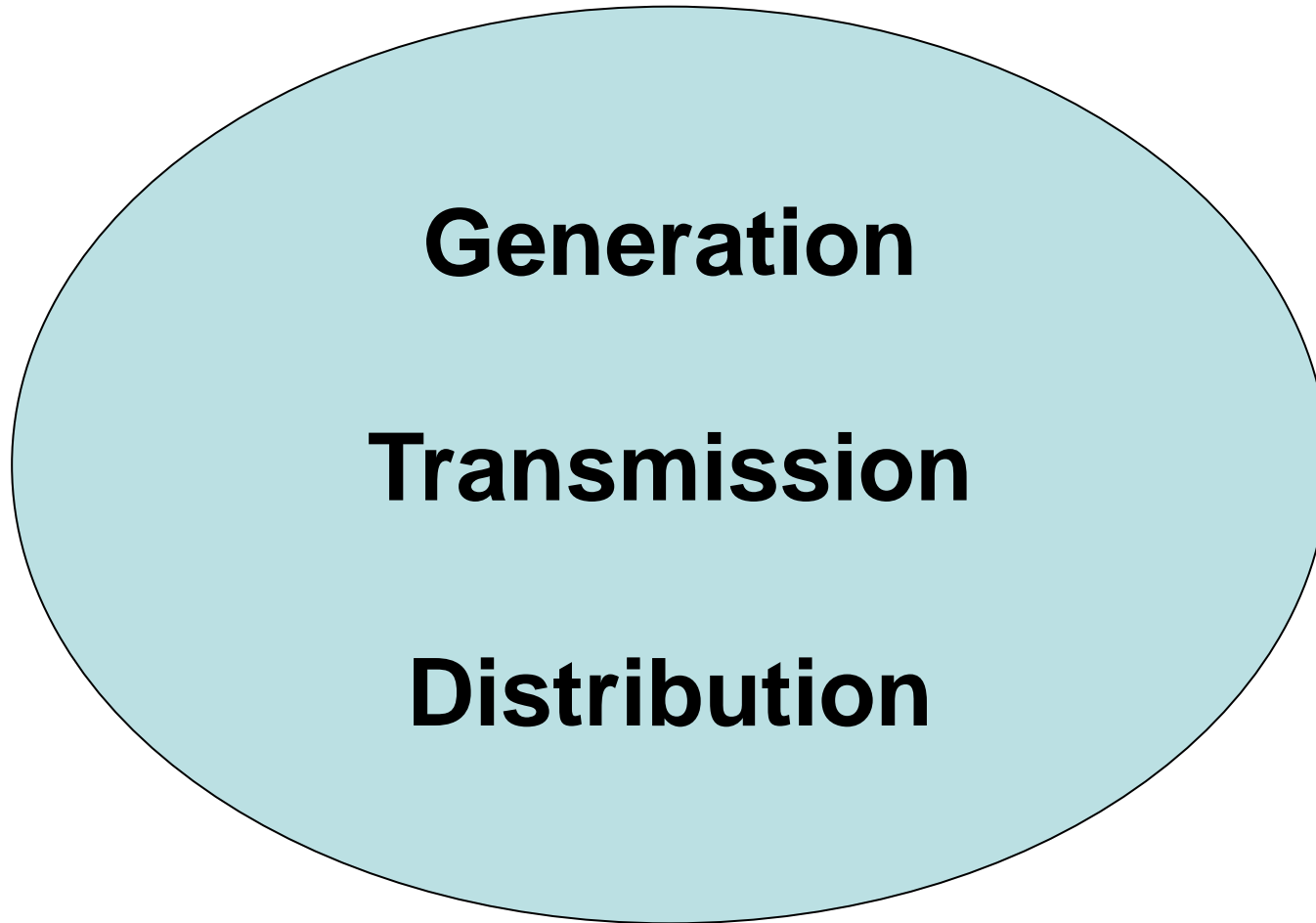
**Generation**

**Transmission**

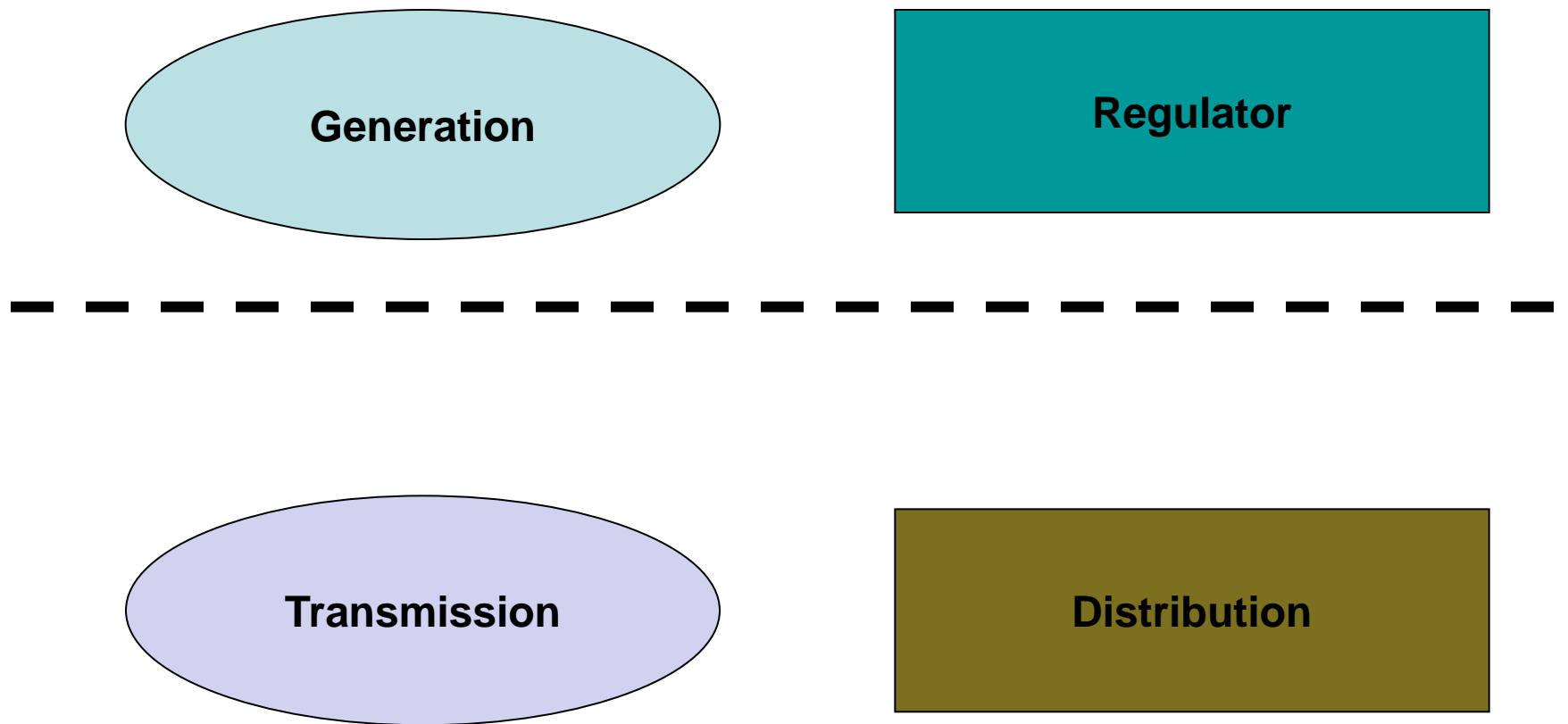
**Distribution**

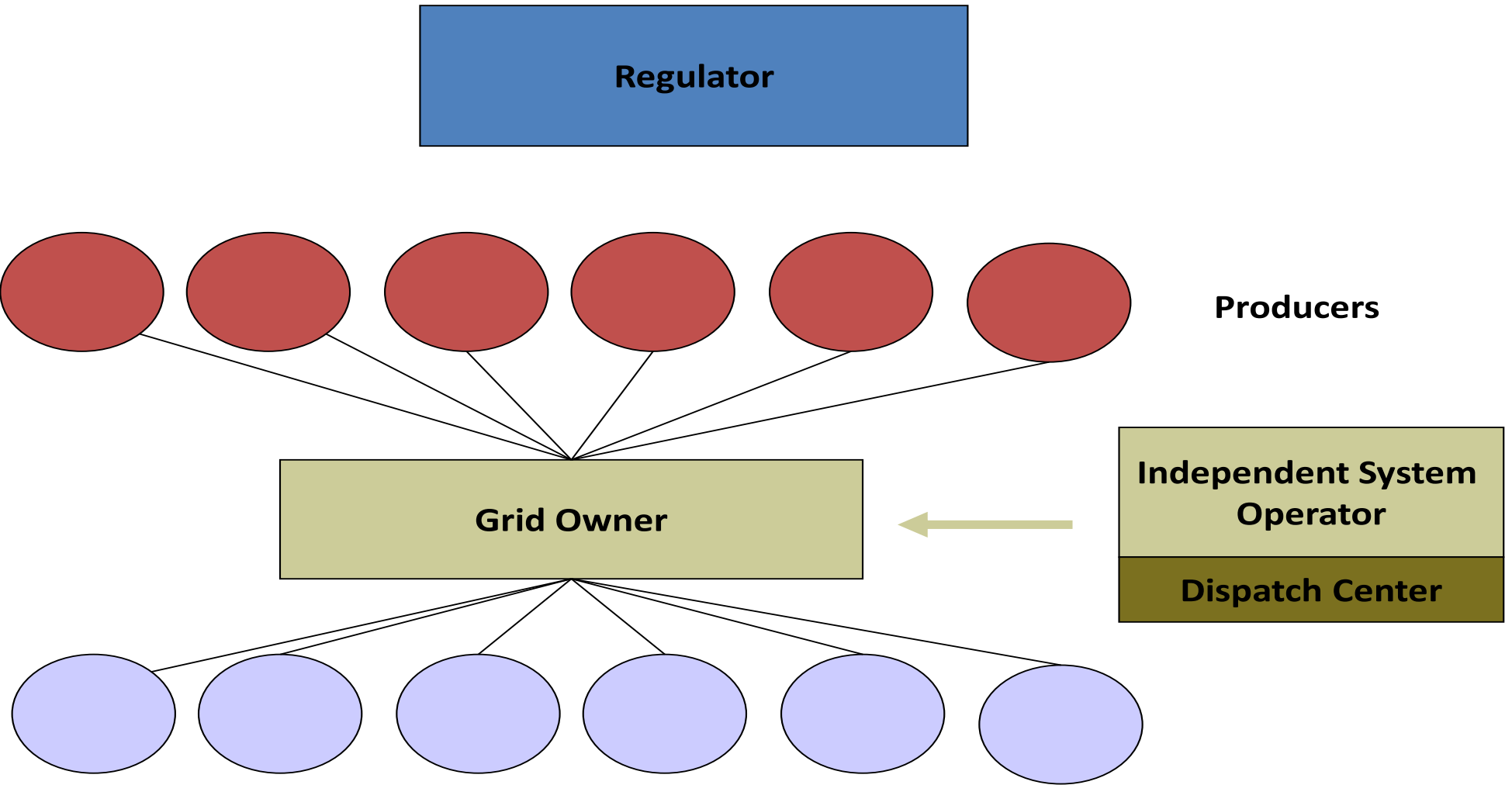
**End-user**

# State owned enterprise

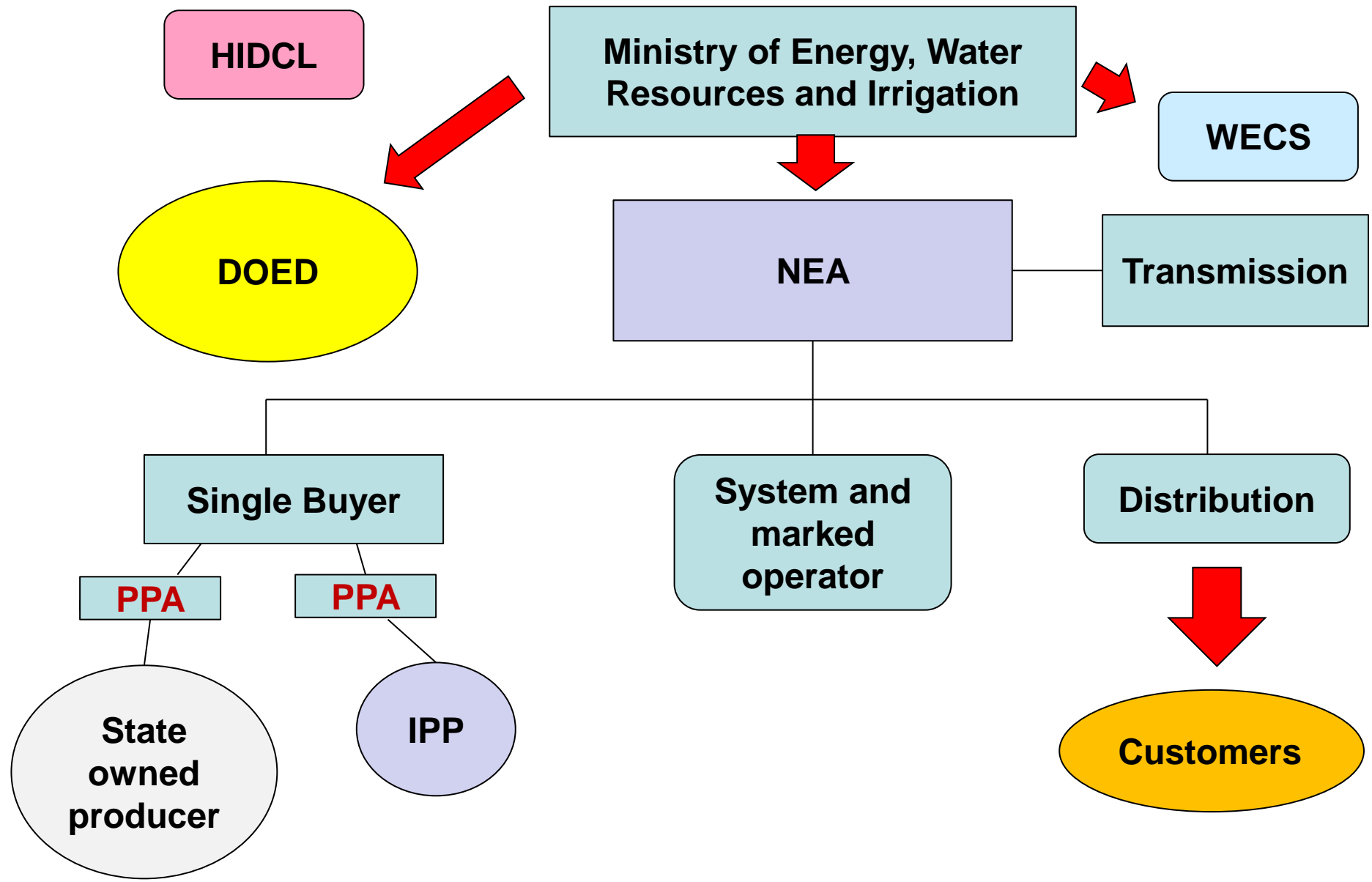


# Unbundling

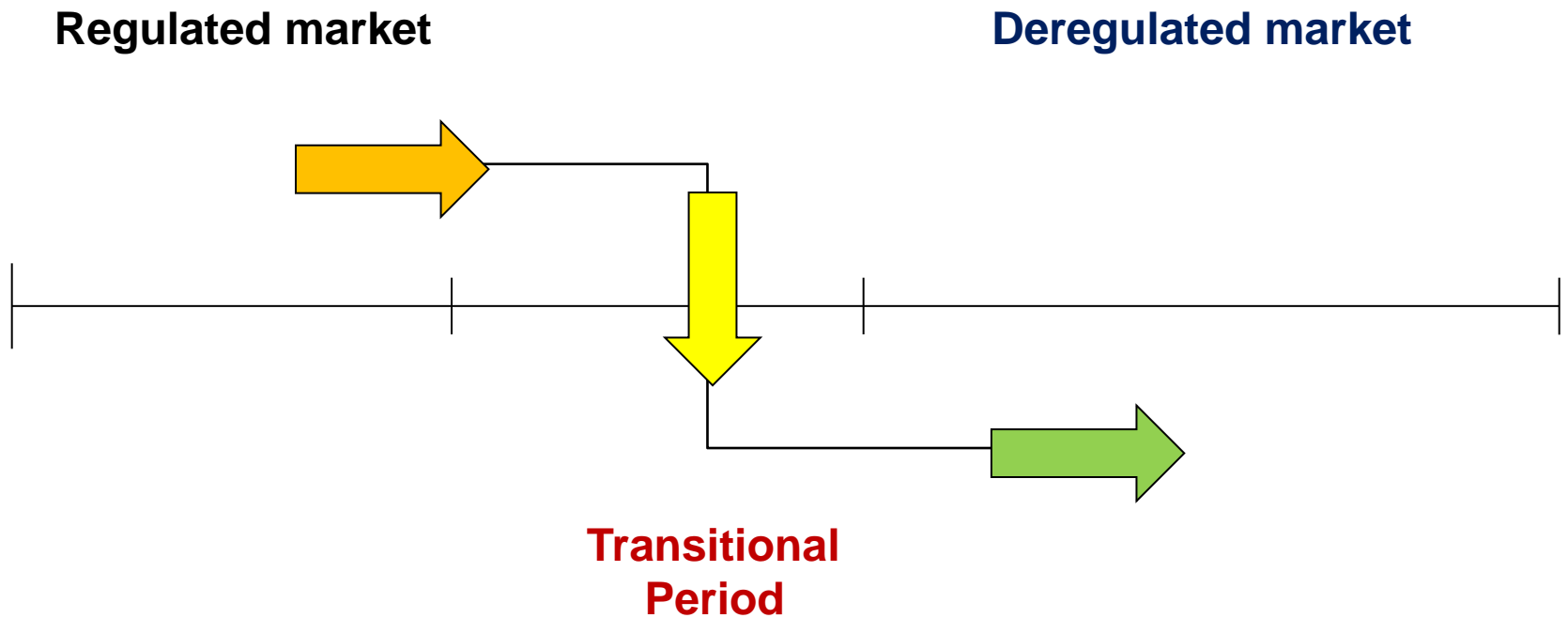




# NEPAL



# Stages of development



## **Measures only applicable in a transitional period:**

- a) Eligible, qualified, captive customers**
- b) Tariffs for electricity to end-users – decided by an authority**
- c) Market operators and pools (single buyer – systems)**
- d) IPPs**
- e) 5 years plan related to building of new generation capacity etc.**



# Who get the benefits of competition ?

- **New York Times; October 23, 2006:**
- **”Four big investment firms bought a group of Texas power plants in 2004 for USD 900 million and sold them the next year for 5.8 billion USD”.**
- **The benefits of competition never reached the end-consumer, - in contrast to the significantly lower prices in other businesses in which competition was introduced, such as airlines and long-distance calling.**

# **Robert McCullough – about Baltimore**

**... ” the same energy is:**

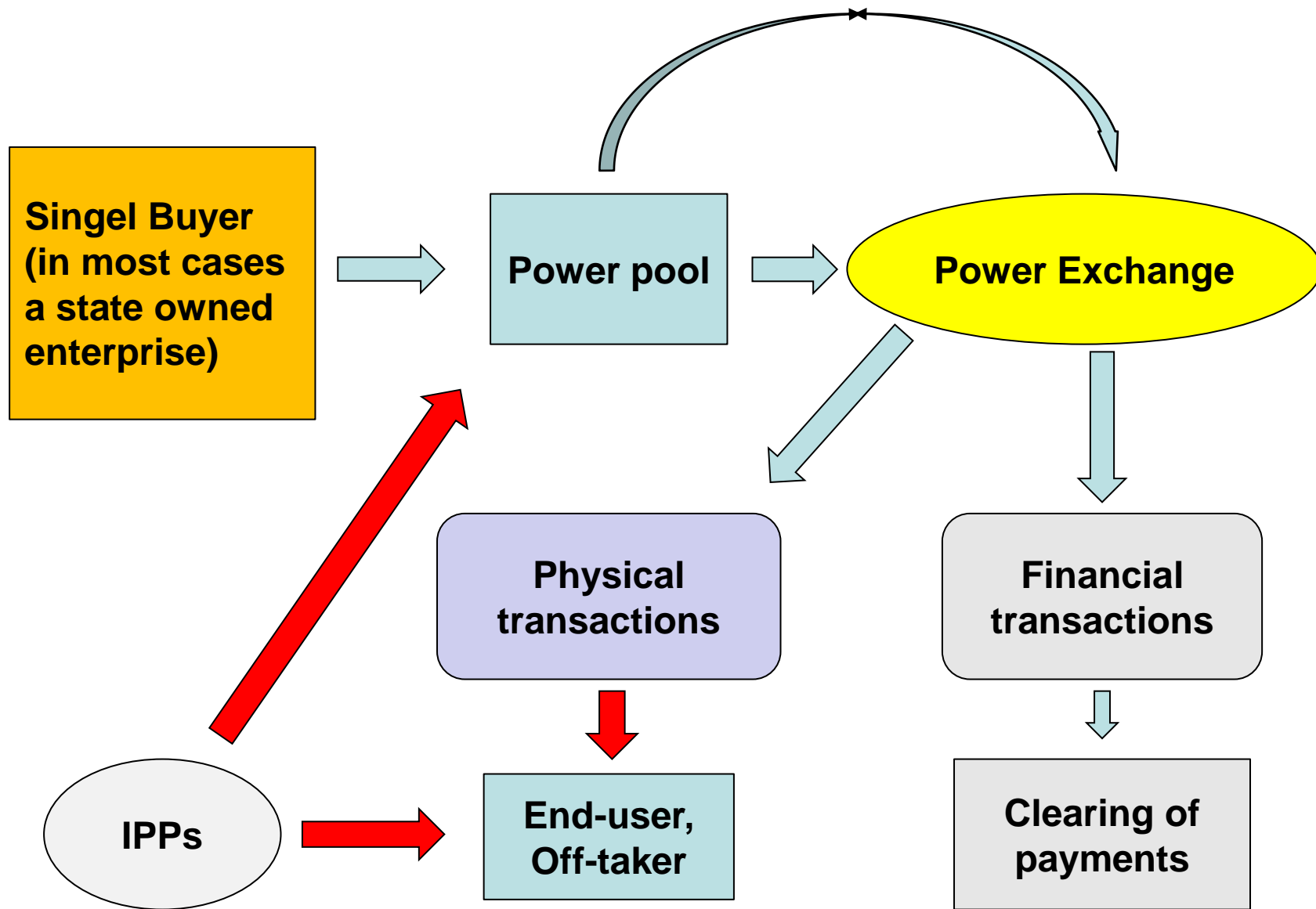
- generated by the same plants,**
- owned by the same owners,**
- and sold to the same customers,**
- simply at a vastly higher price.”**

# Comments to the success story of Norway / Sweden

- **We had a surplus in generation of electricity**
- **The Electricity Supply Industry was dominated by state or municipal/ county owned companies.**
- **Full electrification of the country ( all end-users were connected to the distribution system)**
- **All the Scandinavian countries had a strong economy.**
- **Challenges: What will happen when the demand is higher than the supply?**
- **How to safeguard new investments into the national grid and distribution grids ?**

# Basic requirements to achieve competition

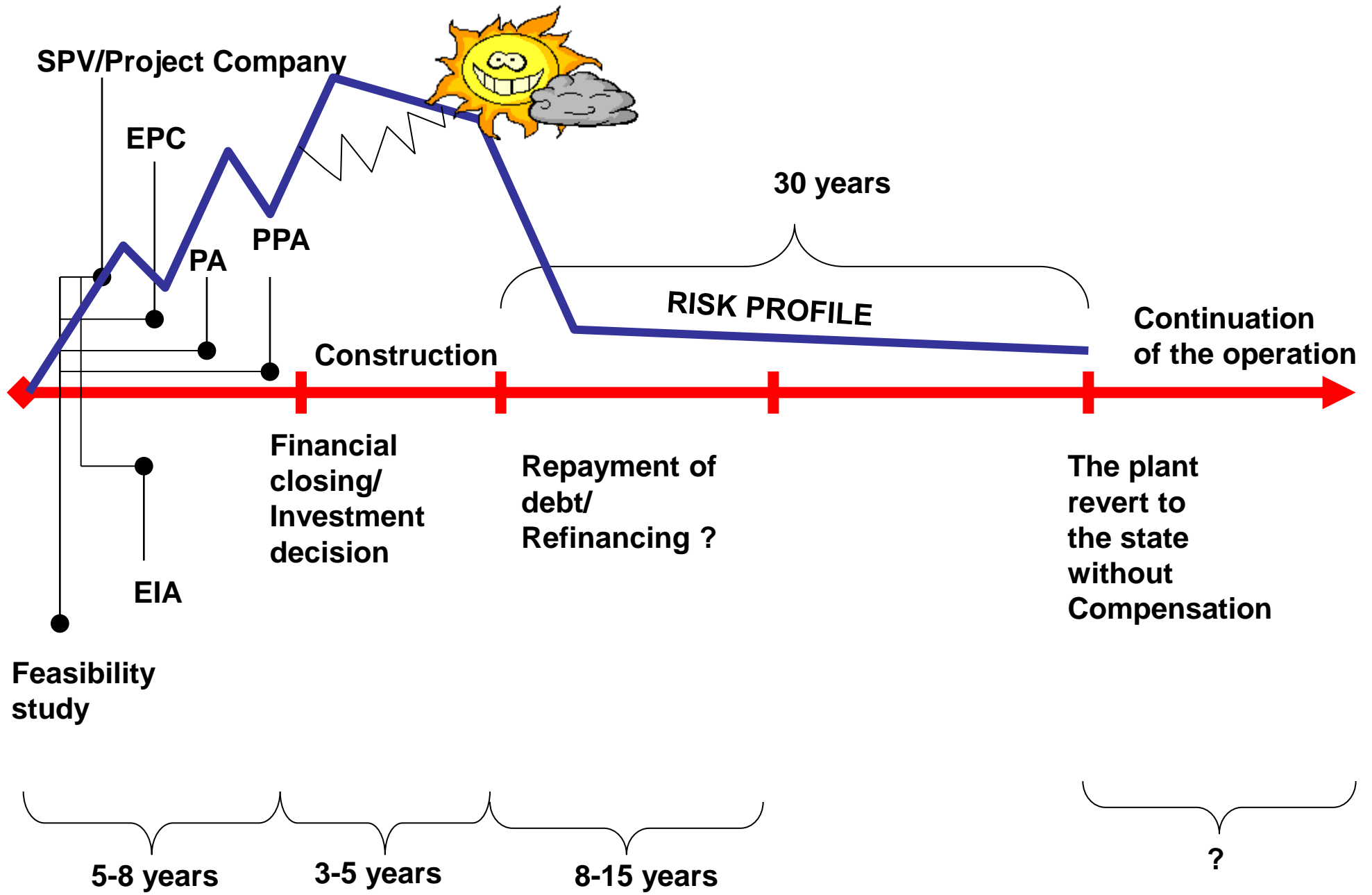
- Competitors – which are allowed to compete on equal terms:
- **Norway:**
  - **66 generation companies (174)**
  - **42 local grid companies ( 159)**
  - **355 companies which have trading concession**



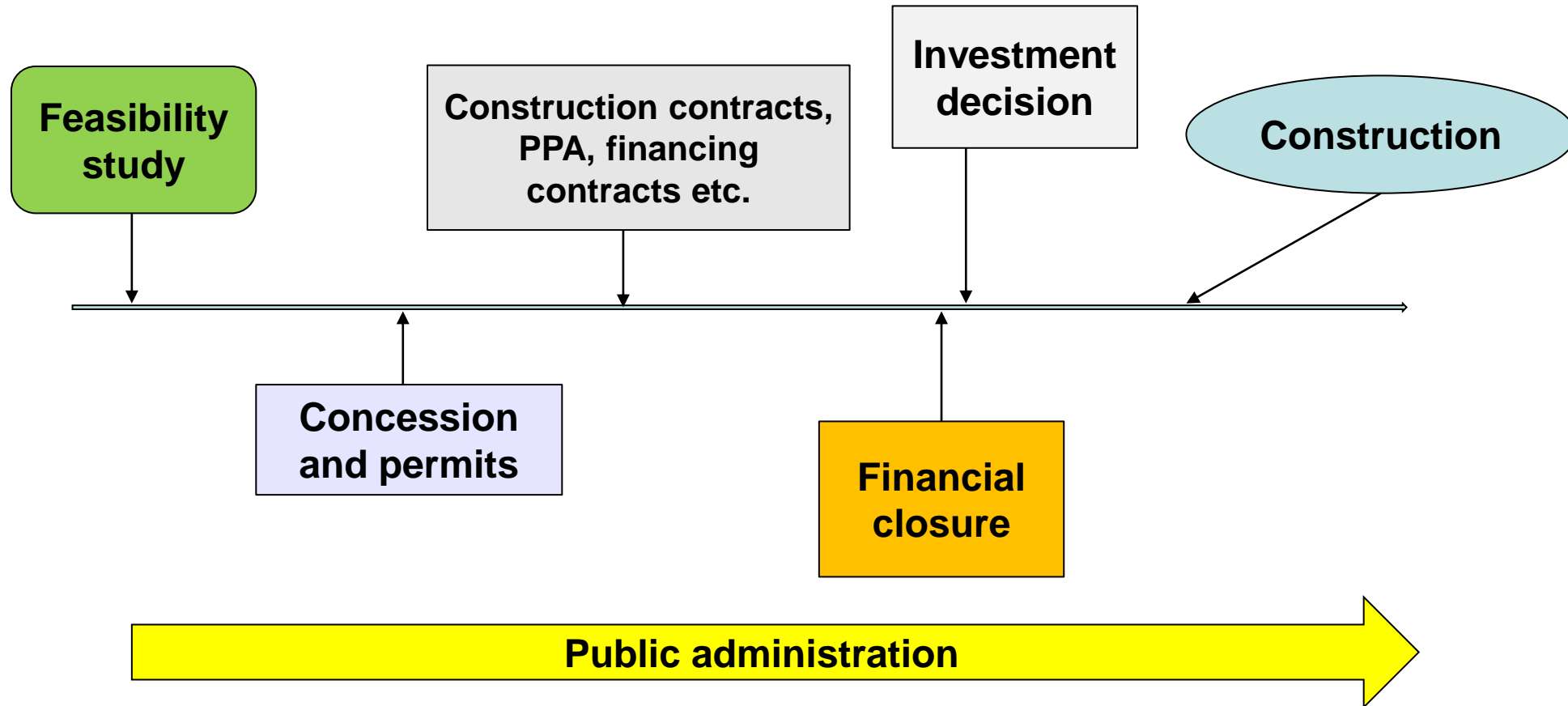
## **To facilitate a regional market (regional integration)**

**This will require:**

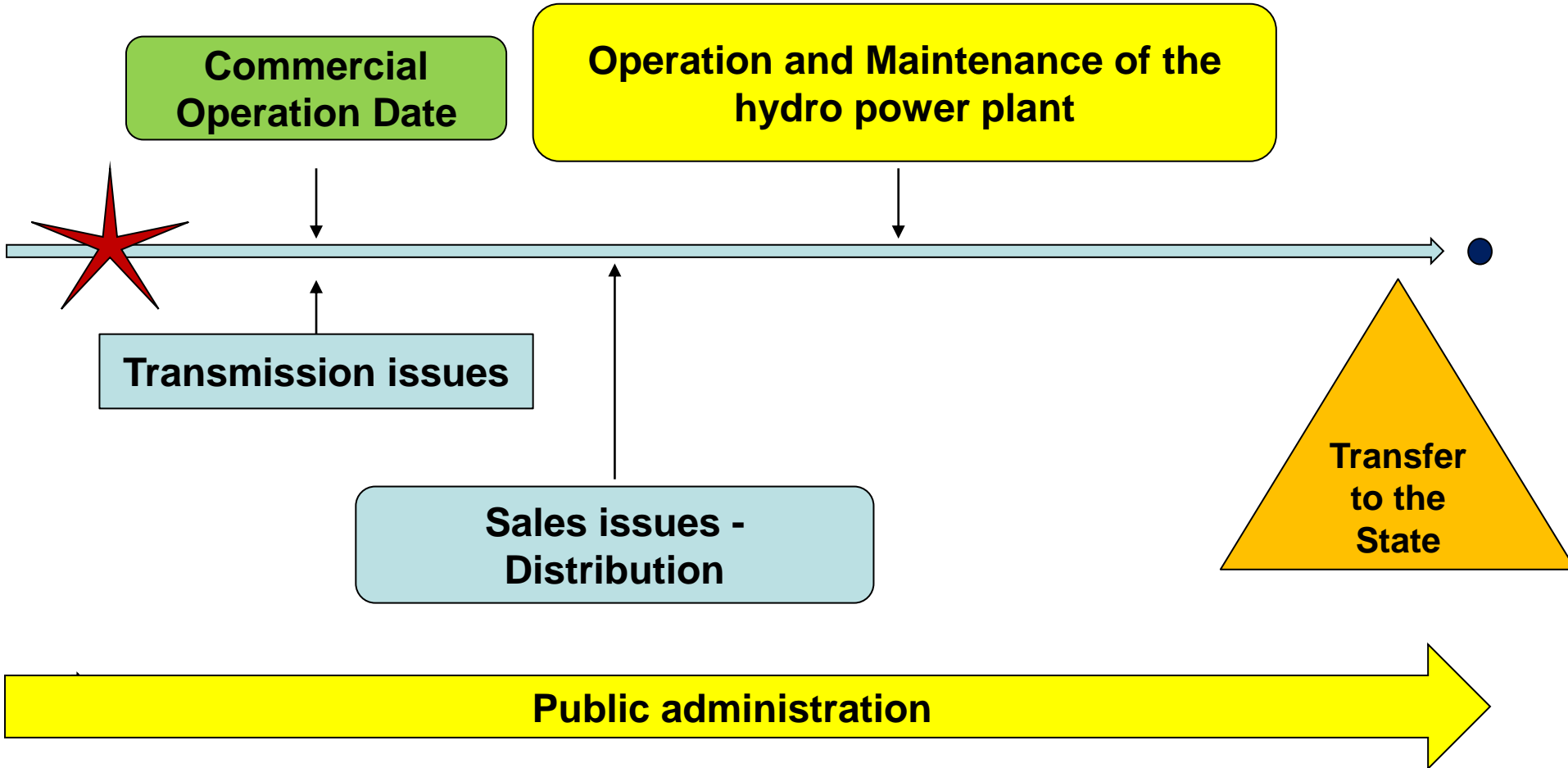
- **Institutional strengthening and reforms**
- **Development of infrastructure (transmission facilities)**
- **Shift from a self-sufficiency approach**
- **Tariffs reflecting the actual cost of supply**
- **Legal and regulatory framework.**
- **Facilitation of private participation, to meet the rapid growth in financing need.**



# The life of a hydro power project





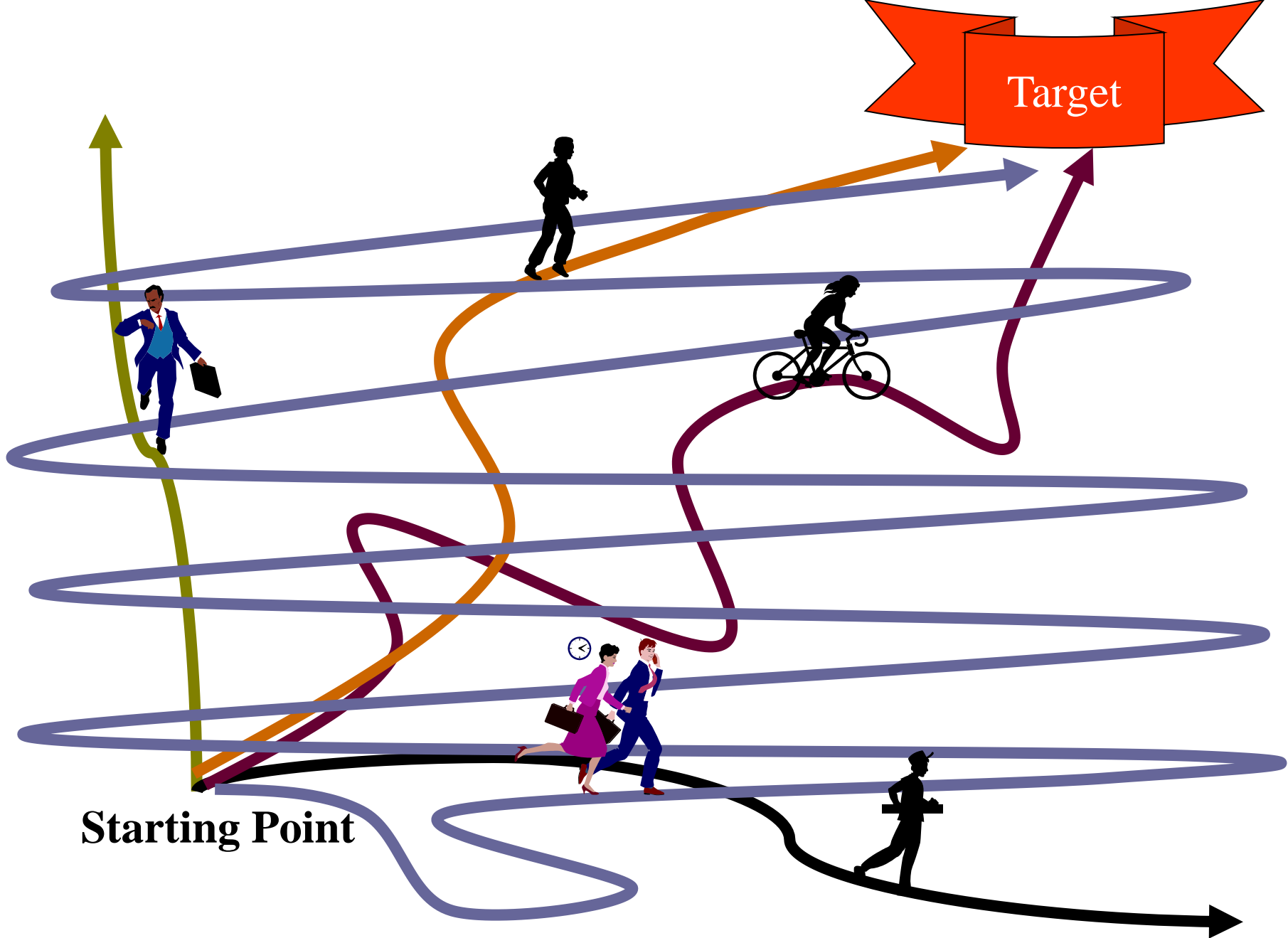


# **Other permission, licenses and approvals to be granted**

- **Access to use/ownership of land**
- **Environmental permits (pollution etc.)**
- **Permits related to planning and construction of buildings and facilities**
- **Permits from Local Governments**
- **Permits to get Visa**
- **Right- of way – and right to use existing infrastructure,**
- **Custom**

# **Benefits of private participation in the electricity market**

- **Access to new resources of financing**
- **Management (and technical) skills**
- **Reduced costs based on competition**



**Thank you for your attention**

