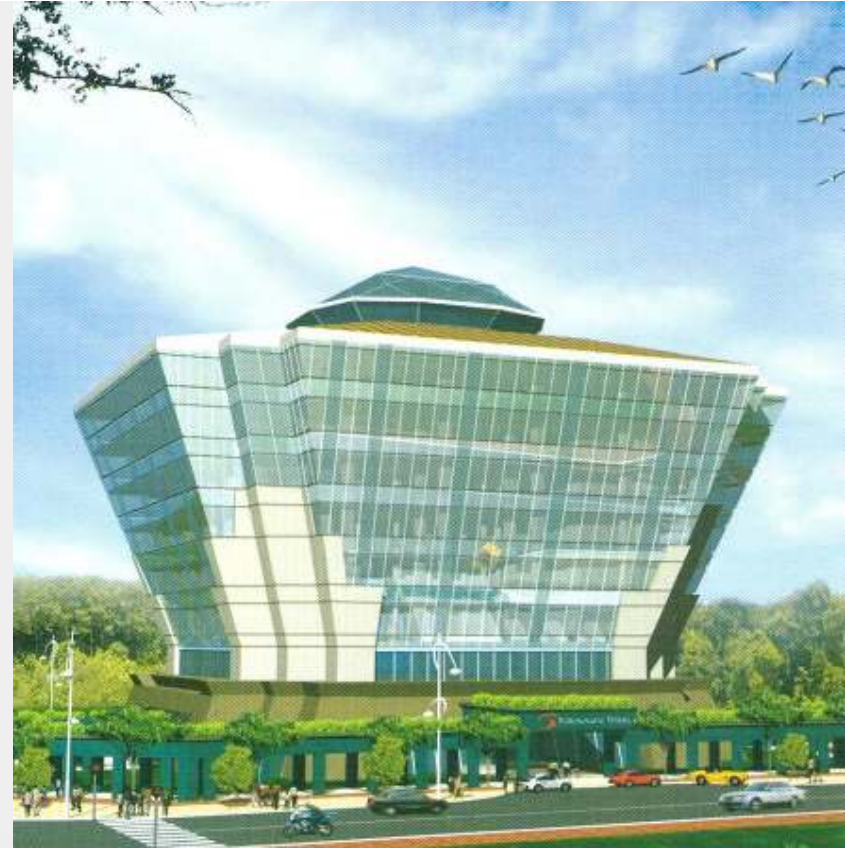


THE MALAYSIAN GRID & DISTRIBUTION CODES

The Overview



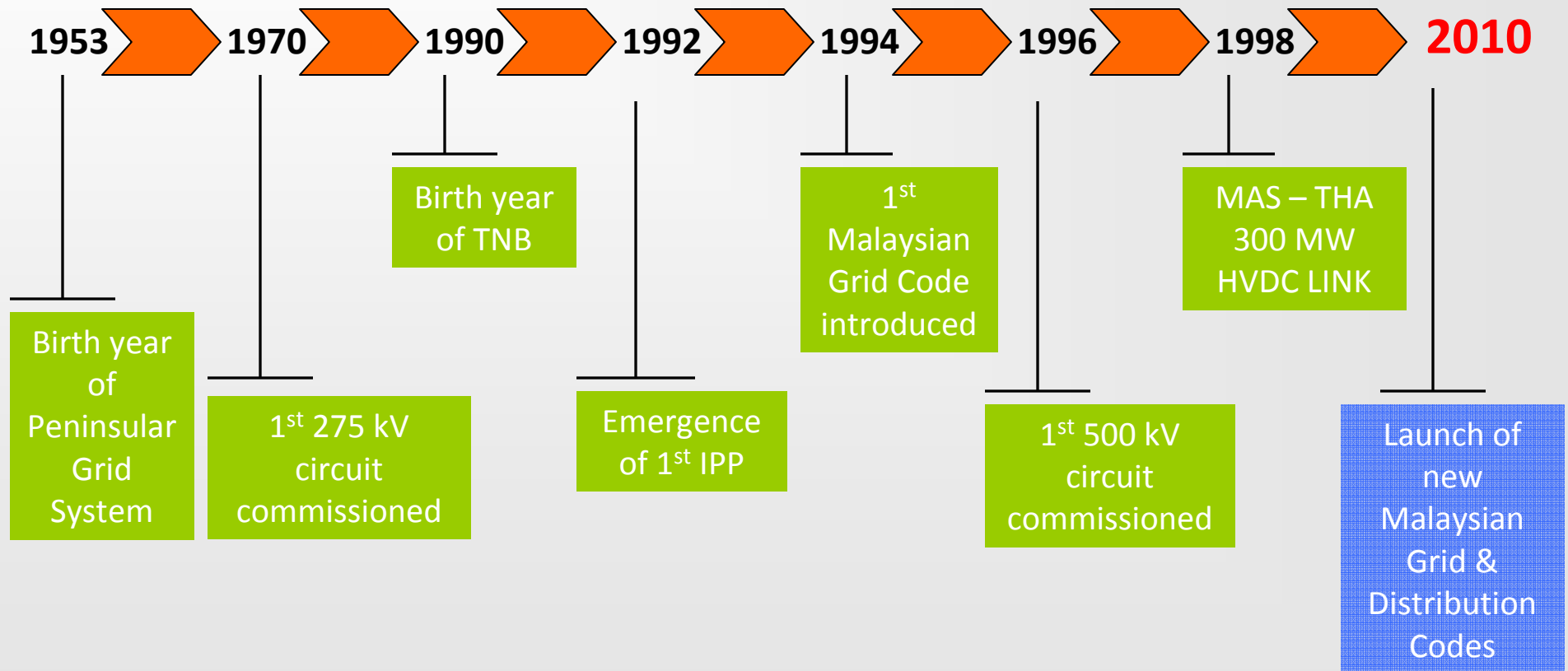
PRE-LAUNCH BRIEFING

*21 December 2010
Cyberview Lodge Resort & Spa*

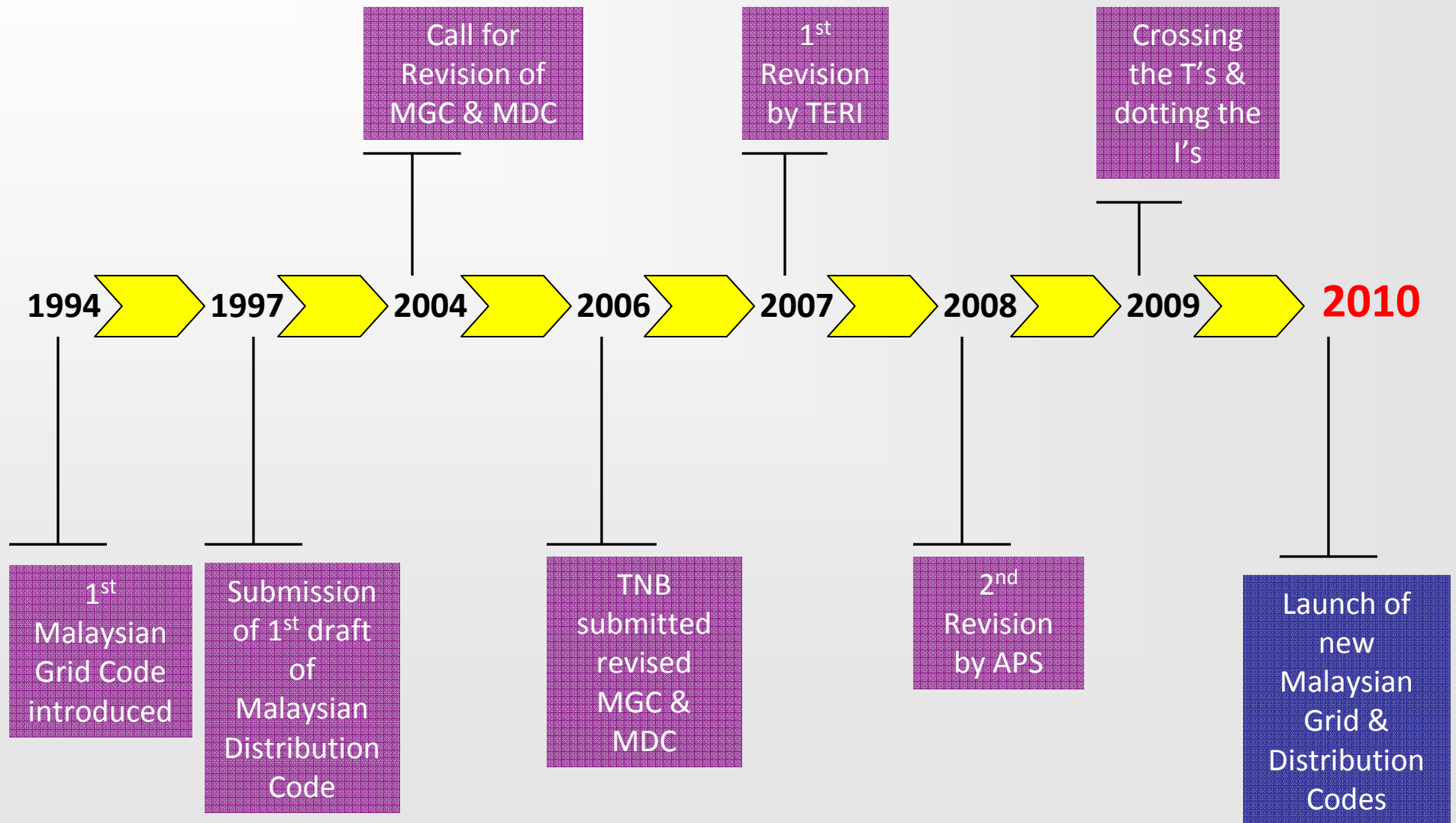
A Background



Development of the Grid System



Chronology of Code Development



Basic Premise of a Grid Code

- Technical document containing requirement, procedures and relationships among transmission network users
- Liberalization within the ESI necessitates a clearly established rules and guidelines
- Centralized around a Grid Owner & a Grid Operator with agreements of other users

General Forms of a Grid Code

- Established & maintained by Grid Owner/Grid Operator and endorsed by the Regulator

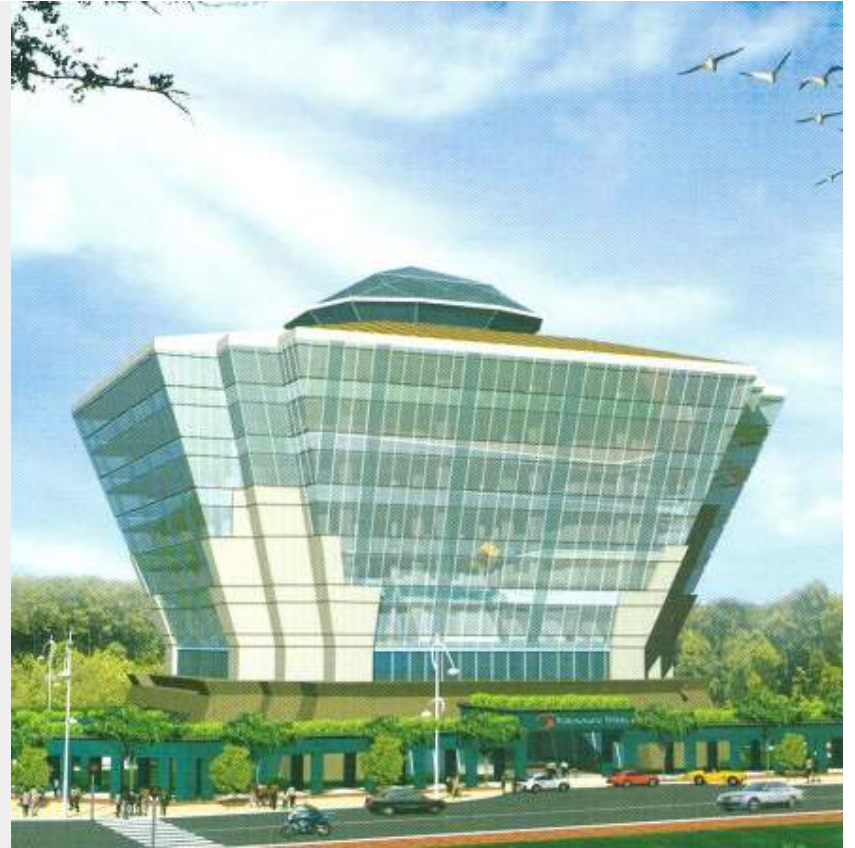
or

- Established by the Regulator and imposed on the Users including Grid Owner/Grid Operator

Framework of a Grid Code

- Permit development, maintenance & operation of a coordinated and economical transmission system
- Facilitate competition in the generation & supply of electricity
- Devoted to planning: system & operational

Regulatory Arrangements



Regulations & Acts

- Electricity Supply Act 1990 (Act 447)
- Licensee Supply Regulations 1990
- Electricity Regulations 1994
- Energy Commission Act 2001 (Act 610)

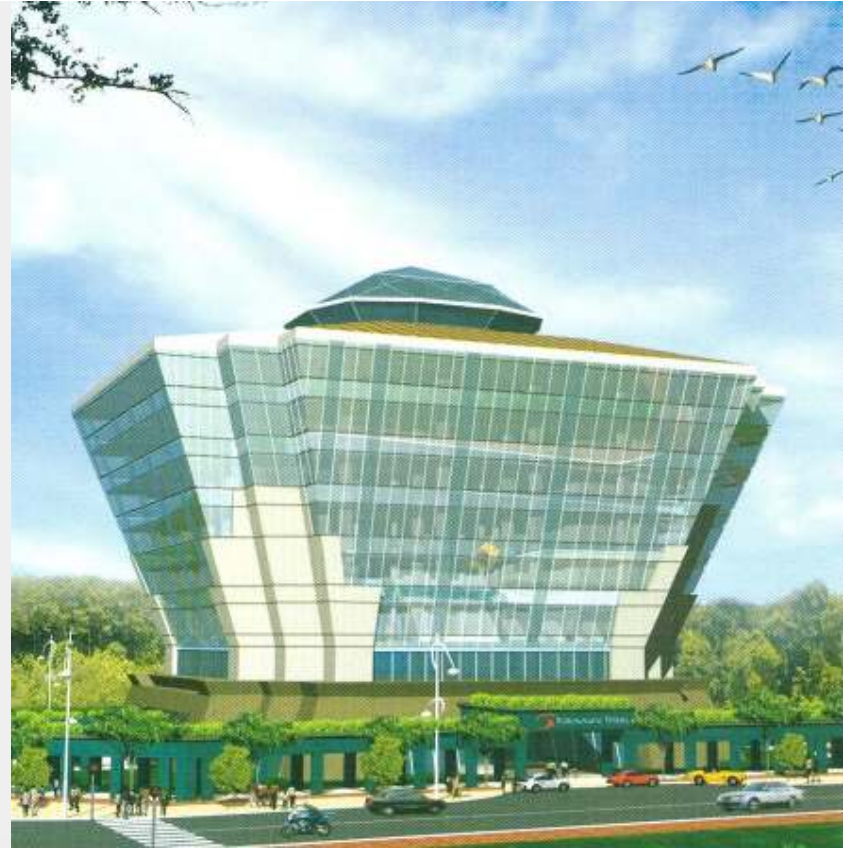
Overlying Intent

- Regulate all matters related to the ESI
- Promote competition in the generation and supply of electricity
- Promote interests of the Consumers

Provisions within License Conditions

- Grid Code
 - GSO to maintain & implement Grid Code
 - Users of Grid System & GSO required to comply
- Distribution Code
 - Distributors to establish & maintain a Distribution Code
 - Users of Distribution System & Distributors required to comply

The Needs



The Need for a Revised Grid Code

- Current Malaysian Grid Code not in line with industry structure and practices
- Clearer separation of roles and authority
- To ensure continuity for an efficient and secure development and operation

The Need for a Distribution Code

- No Distribution Code currently exist
- To set out principles governing the relationship between GSO, EC & all users of the distribution system
- The advent of Distributed Generation
- Designation of franchise Distributors

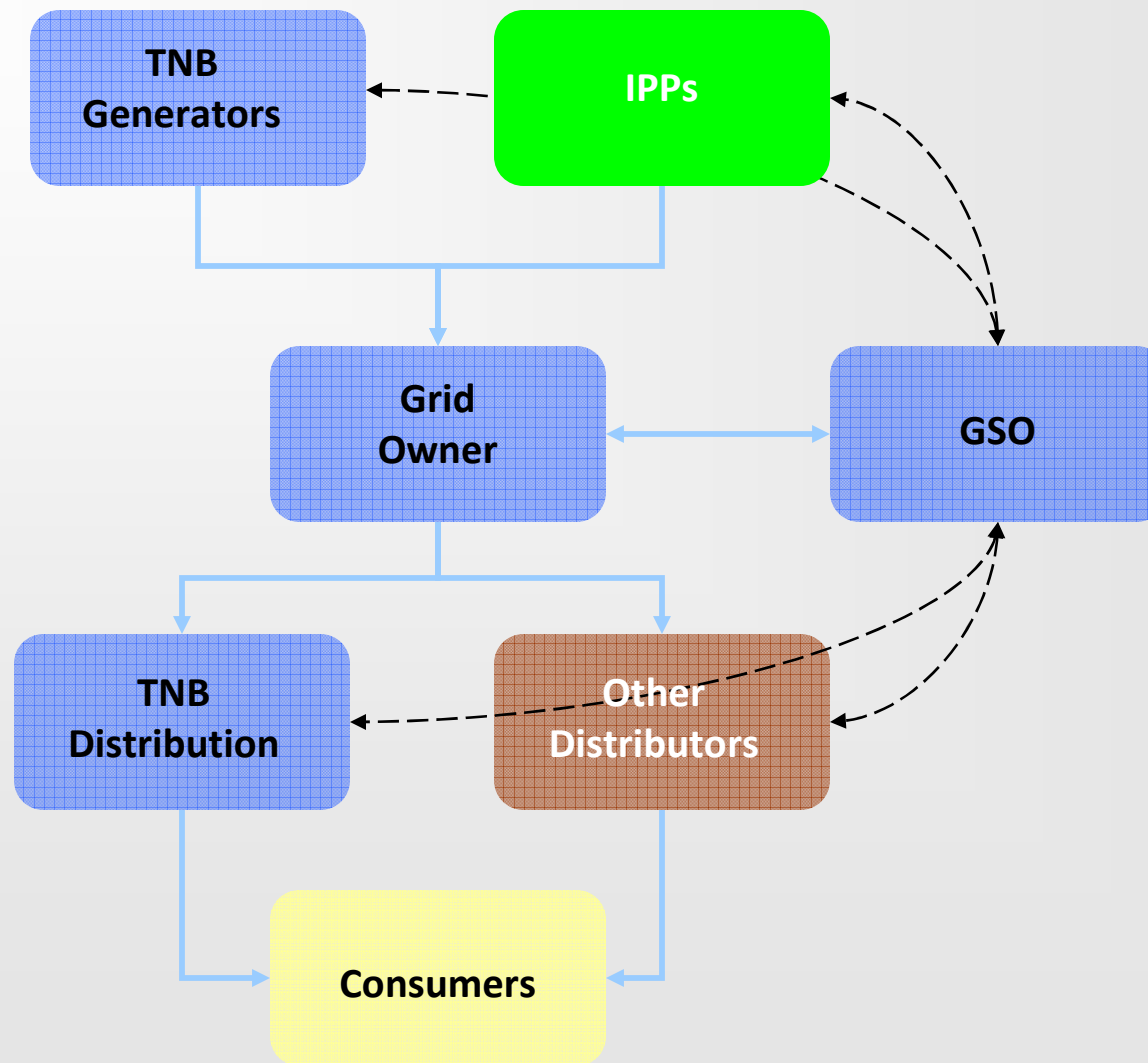
The Distribution System

- Operates below 66 kV
- Purchase of power from the Grid System
- Provision and operation of Medium & Low Voltage Distribution Networks
- Provision of service lines for retail sales

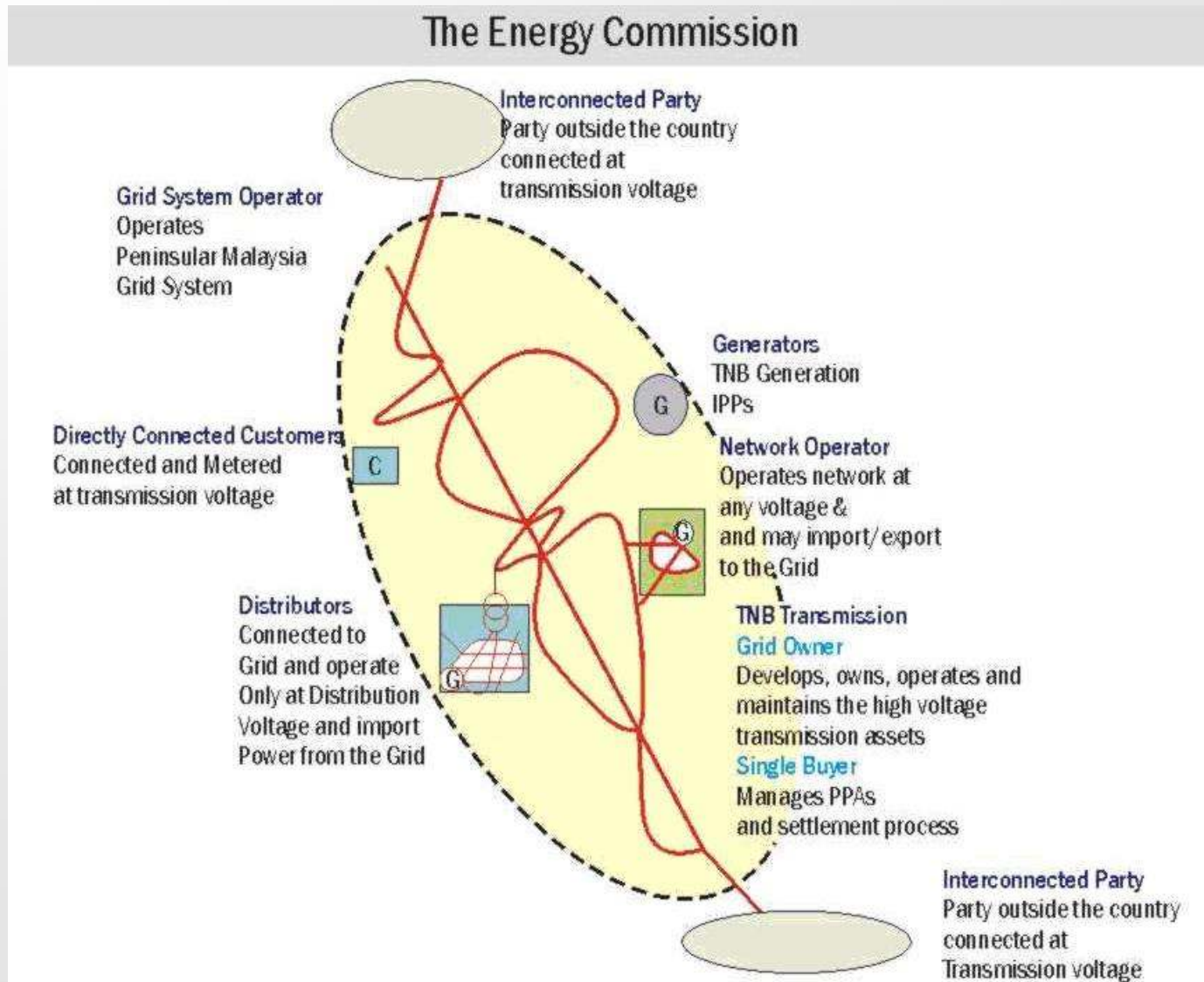
What's New



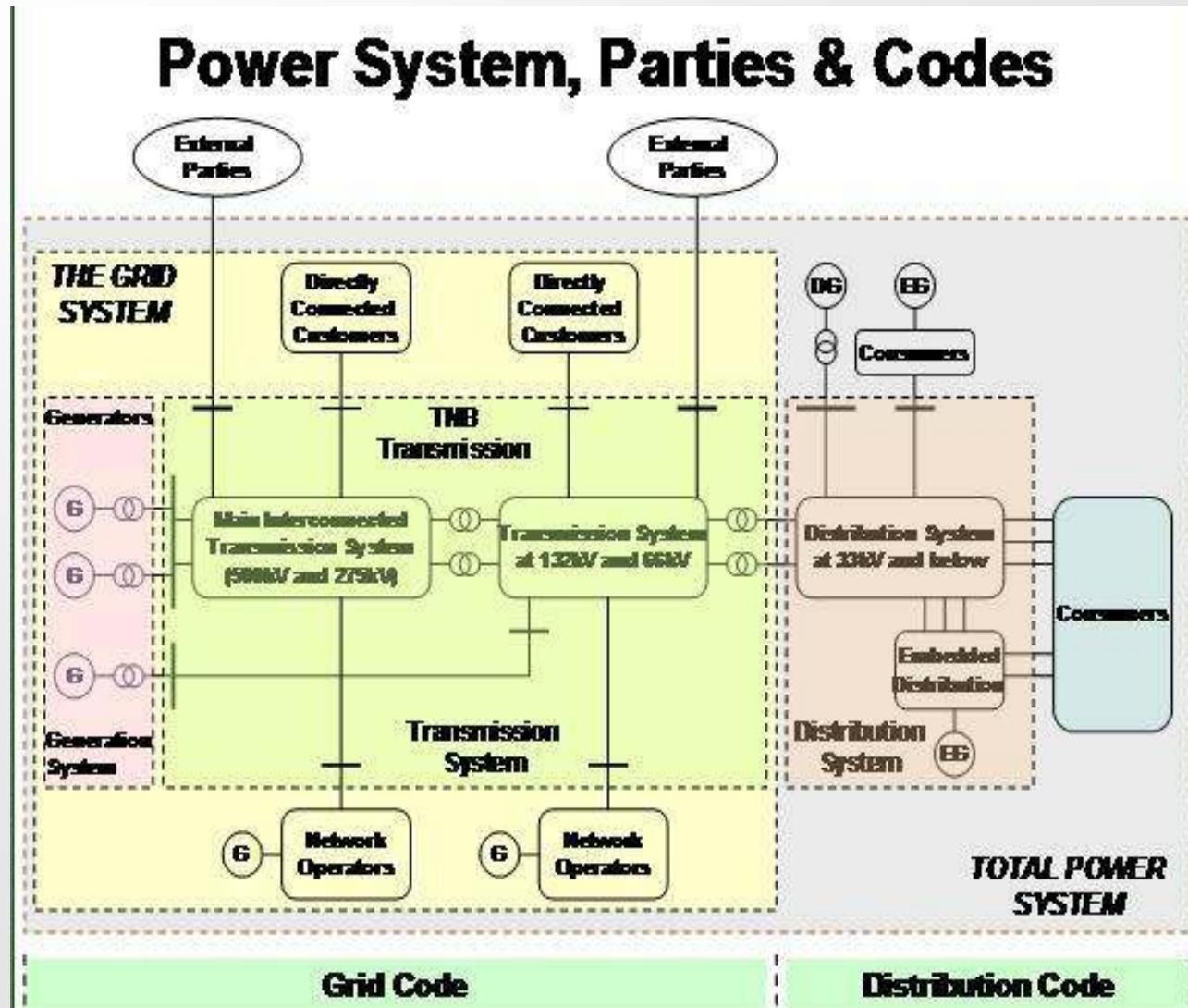
Current Industry Structure



Parties in the New Codes



Interactions within the System



Redefined Roles

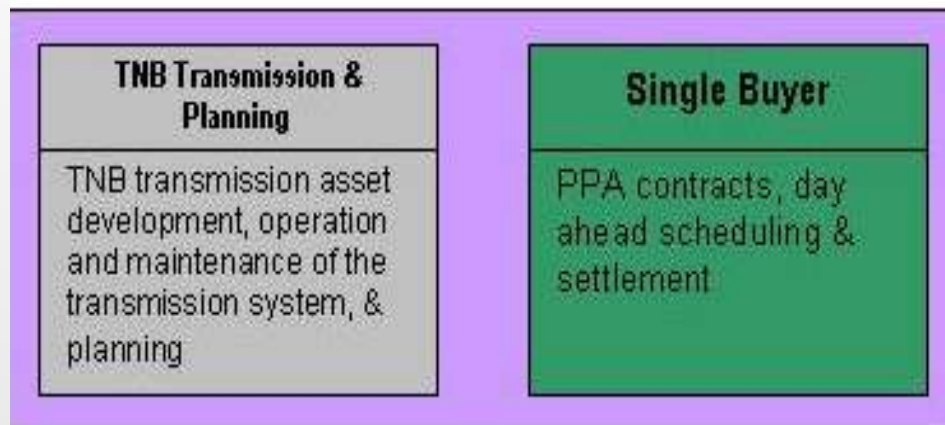
- TNB
 - Registered incorporated company comprising of Generation, Transmission & Distribution
 - Grid Owner, planner, operator and off-taker (Single Buyer)
- Grid Owner
 - The party that owns the HV backbone Transmission System
 - Responsible for maintaining adequate Grid Capacity
 - Carry out transmission functions via TNB Transmission

Redefined Roles (cont.)

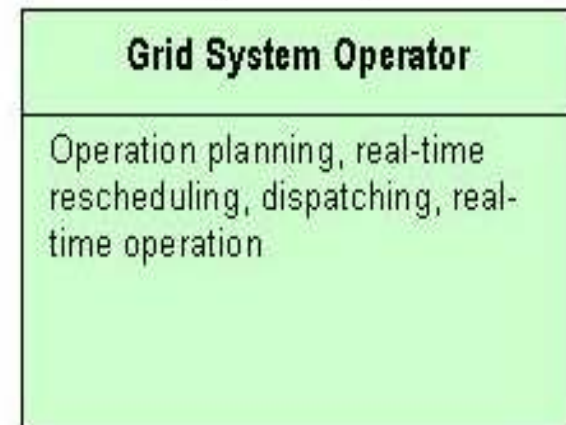
- Grid System Operator (GSO)
 - A part of TNB responsible for operational planning, real-time rescheduling, dispatch and control of the Grid System
- Single Buyer
 - A part of TNB responsible for day-ahead scheduling and managing PPAs, SLAs & settlement process

Redefined Roles (cont.)

Grid Owner



Grid System Operator



Redefined Roles (cont.)

- Distributed Generation
 - Small generation connected to a Distribution System or an Embedded Distributor and not connected to a Transmission System
- Embedded Distributor
 - Licensee connected to a Distributor's Distribution System and not connected to a Transmission System

Grid Code Committee

□ Chairman: Energy Commission

• Members:

- 9 from TNB
- 6 from IPP
- 1 independent technical expert
- 1 from Minor Distributor
- 2 observers from Energy Commission

Independent External Audit

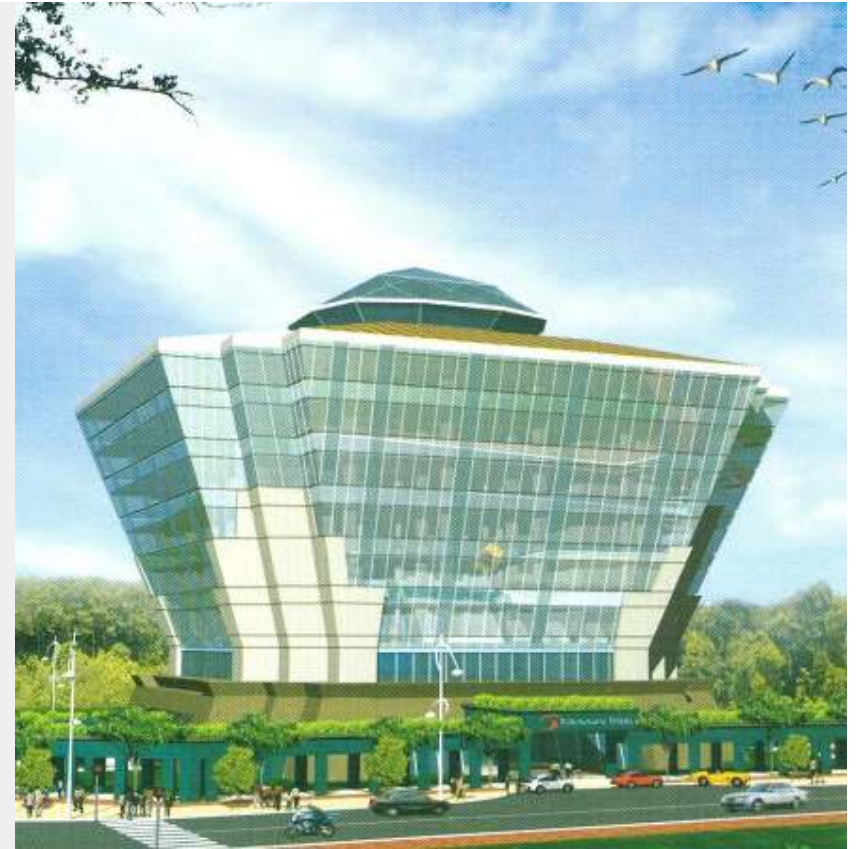
- Appointed by GCC
 - Review operations & performance of GSO & SB especially relating to scheduling
 - Evaluate significant grid events
 - Identify difficulties in MGC and make recommendations
- Rules, procedures & functions formulated by GCC and approved by EC

Distribution Code Committee

□ Chairman: Energy Commission

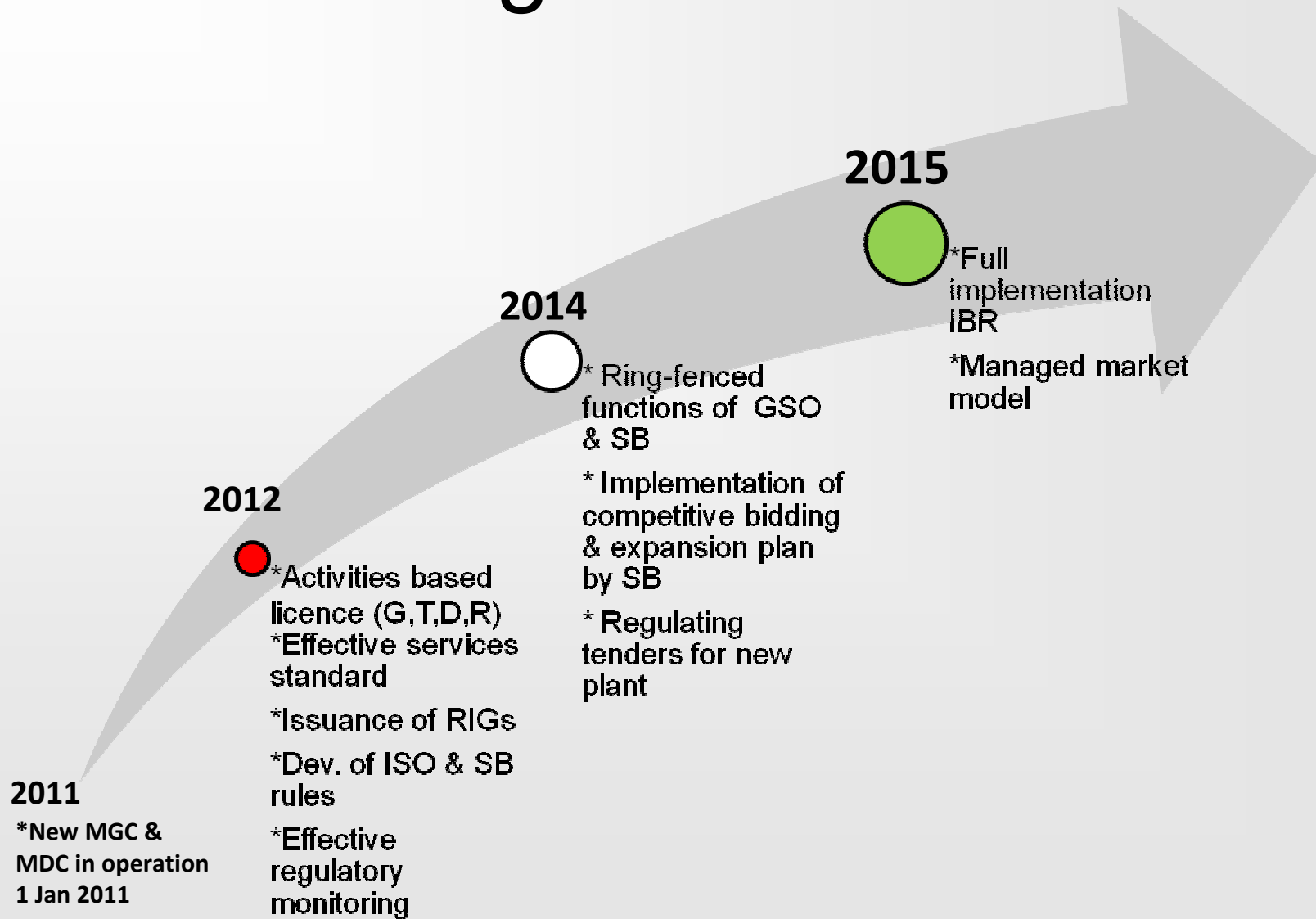
• Members:

- 1 from Energy Commission
- 5 from TNB
- 4 from other Distributors
- 2 from Distributed Generators
- 1 from Consumer
- 2 observers from TNB
- Additional members if required by DCC



Moving Forward

Looking to the Future





**TERIMA KASIH
THANK YOU**

*Ahmad Johari Jaffar
Suruhanjaya Tenaga*