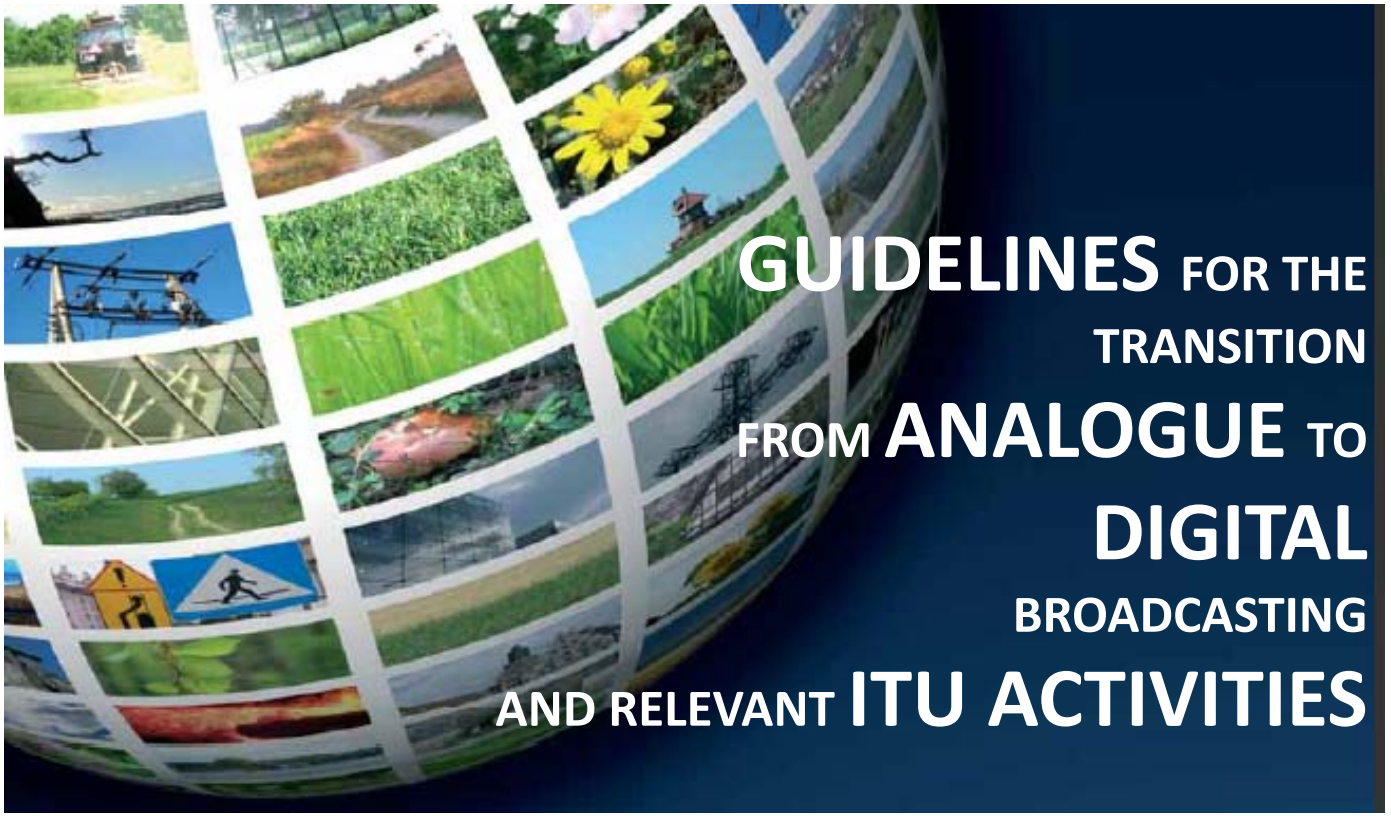
INTERNATIONAL TELECOMMUNICATION UNION



István Bozsóki, Head, ITU/BDT/IEE/SBD

Content

Introduction

Situation and challenge

Scope and objective

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National roadmap development

ITU Activities: Assistance, Meetings and Documents

Conclusions

Introduction

A roadmap is a management forecasting tool	• Directed to the implementation of strategy and related to project planning • Matching short-term and long-term goals • Indicating the main activities needed to meet these goals
Roadmap development has three major uses	• Helping to reach consensus about requirements and solutions • Providing a mechanism to help forecast the key milestones • Providing a framework to help plan and coordinate the steps needed

Situation and challenge

Situation

- ITU/BDT activity on the implementation of regional initiatives projects approved by WTDC-06 and WTDC-10
- With support of:
  - ITU
  - Korea Communications Commission (KCC), Republic of Korea
  - Ministry of Internal Affairs and Communications (MIC), Japan

Challenge

- Efficient spectrum management and the transition from analogue to digital broadcasting are critical issues for policy makers, regulators, broadcasters and other stakeholders
  - Given the increasing demand for limited radio-frequency resources
- Different time-scales for transition from analogue to digital broadcasting according to:
  - National priorities
  - GE06 Agreement, where applicable
    - analogue TV will no longer be protected after 17 June 2015
    - In a number countries, including 31 African countries, not after 17 June 2020 in Band III

Scope and objective

Scope	• Guidelines on
	  o Transition from analogue TV to Digital Terrestrial Television Broadcasting (DTTB)
	  o Introduction of Mobile Television Broadcasting (MTV)
	• Identification of
	  o Policy, economic and technology choices
	  o Their potential impact DTTB and MTV introduction
	• Providing
	  o Information regarding the cost benefit analysis of policy decisions and best practices
	  o Many practical examples and references to documents for additional or more detailed information

Objective	• To assist administrators, regulators, broadcasters and other stakeholders in developing countries in researching and supporting the introduction of digital broadcasting

Guideline: Situation and Updates

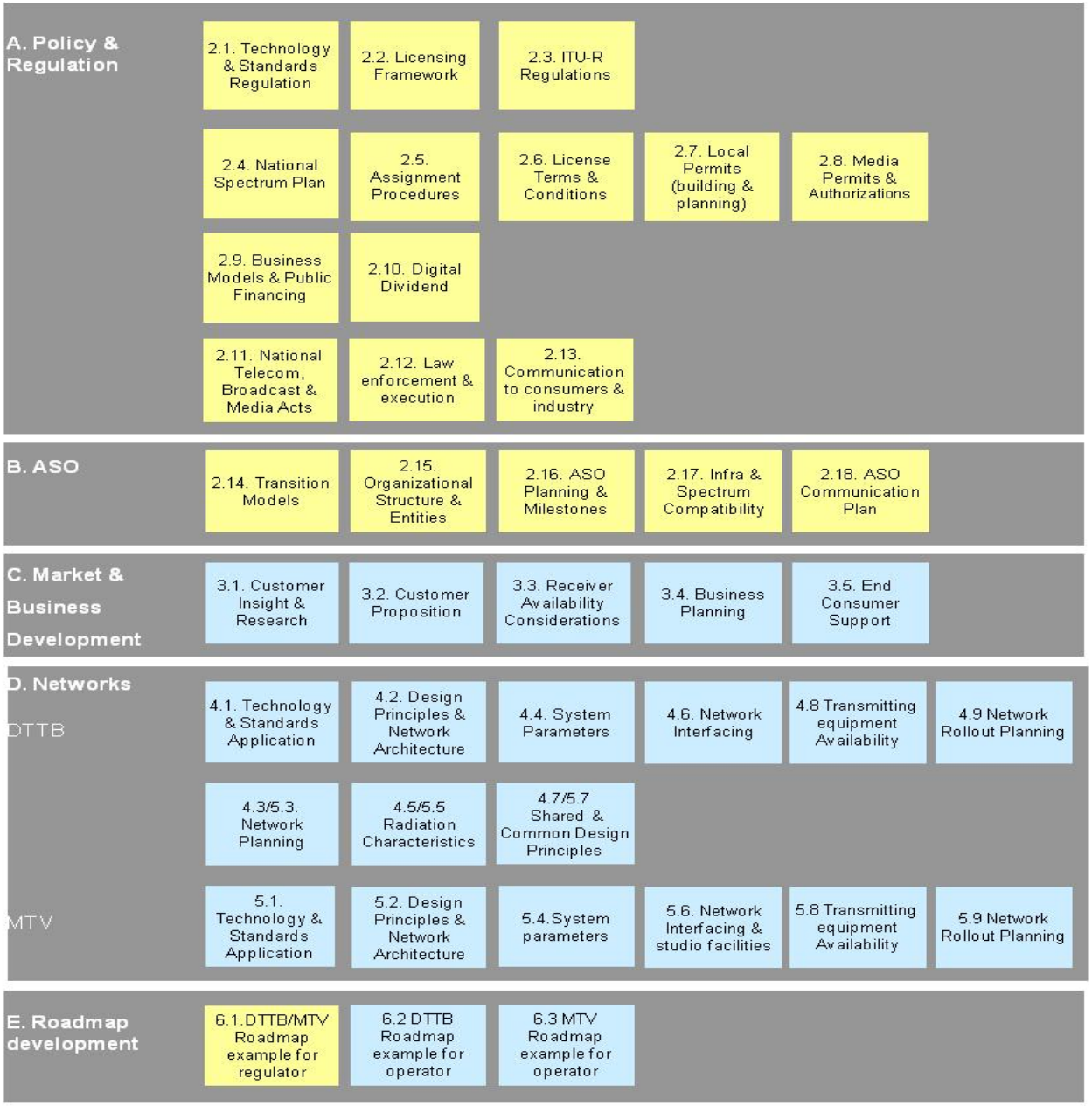
ORIGINAL

UPDATES

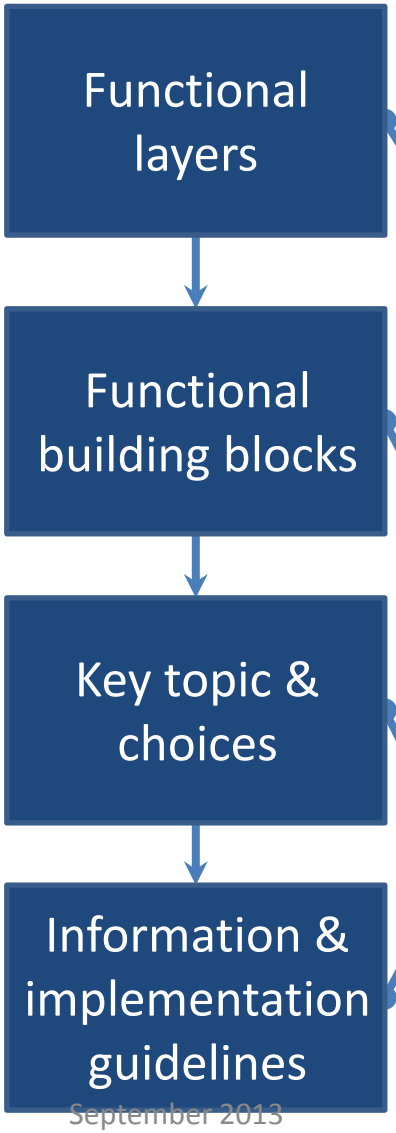
- 2009 funded by KCC: for African countries (80 % general)
- 2011 (KCC): Guidelines Updated to reflect the different ITU rules and requirements in Region 3 (Asia Pacific)
- Addition of New Chapter on Archives Migration
- 2013 Project funded by MIC, Japan
- Incorporate
  - updated information, new technologies,
  - satellite TV, cable TV, IPTV
- Tokyo, April 2013: Group of experts
  - Jan Doeven, Peter Walop, Gu-Yean Hwang
  - Colin Knowles
  - Junji Kumada, Yukihiro Nishida, Sharad Sadhu, Kazuyoshi Shogen
- In cooperation with
  - Roger Bunch, vice-chairman of ITU-R Study Group 6
  - ITU BR and BDT

Structure of the Guidelines

Part 1	Introduction
Part 2	Policy and regulation
Part 3	Market and business development
Part 4	DTTB networks
Part 5	MTV networks
Part 6	Roadmap development
Annex A	Implementation of the GE06 Agreement
Annex B	More detailed information on some regulatory topics
Annex C	More detailed information on some DTTB network topics
Annex D	More detailed information on some MTV network topics
Annex E	Guidelines for migration of broadcast archives from analogue to digital
Annex F	Television broadcasting via satellite
Annex G	Television broadcasting via cable TV networks and IPTV


A. Policy & Regulation
2.1. Technology & Standards Regulation
2.2. Licensing Framework
2.3. ITU-R Regulations
2.4. National Spectrum Plan
2.5. Assignment Procedures
2.6. License Terms & Conditions
2.7. Local Permits (building & planning)
2.8. Media Permits & Authorizations
2.9. Business Models & Public Financing
2.10. Digital Dividend
2.11. National Telecom, Broadcast & Media Acts
2.12. Law enforcement & execution
2.13. Communication to consumers & industry
B. ASO
2.14. Transition Models
2.15. Organizational Structure & Entities
2.16. ASO Planning & Milestones
2.17. Infra & Spectrum Compatibility
2.18. ASO Communication Plan
C. Market & Business Development
3.1. Customer Insight & Research
3.2. Customer Proposition
3.3. Receiver Availability Considerations
3.4. Business Planning
3.5. End Consumer Support
D. Networks
DTTB
4.1. Technology & Standards Application
4.2. Design Principles & Network Architecture
4.4. System Parameters
4.6. Network Interfacing
4.8 Transmitting equipment Availability
4.9 Network Rollout Planning
4.3/5.3. Network Planning
4.5/5.5 Radiation Characteristics
4.7/5.7 Shared & Common Design Principles
MTV
5.1. Technology & Standards Application
5.2. Design Principles & Network Architecture
5.4.System parameters
5.6. Network Interfacing & studio facilities
5.8 Transmitting equipment Availability
5.9 Network Rollout Planning
E. Roadmap development
6.1.DTTB/MTV Roadmap example for regulator
6.2 DTTB Roadmap example for operator
6.3 MTV Roadmap example for operator
= Government led
= Market led

Functional framework



Functional layer	Guidelines
A. Policy & regulation	Part 2; Annex B
B. Analogue switch-off (ASO)	Part 2; Annex F, G
C. Market & business development	Part 3; Annex F, G
D. DTTB & MTV networks	Part 4 & 5; Annex A, C, D
E. Roadmap development	Part 6

- Each layer contains 3 to 13 functional building blocks

- Each functional building block is described in the corresponding chapters of Part 2 to 6, including
  - Key topics and choices
  - Implementation guidelines

Layer A

Layer A

Policy & regulation

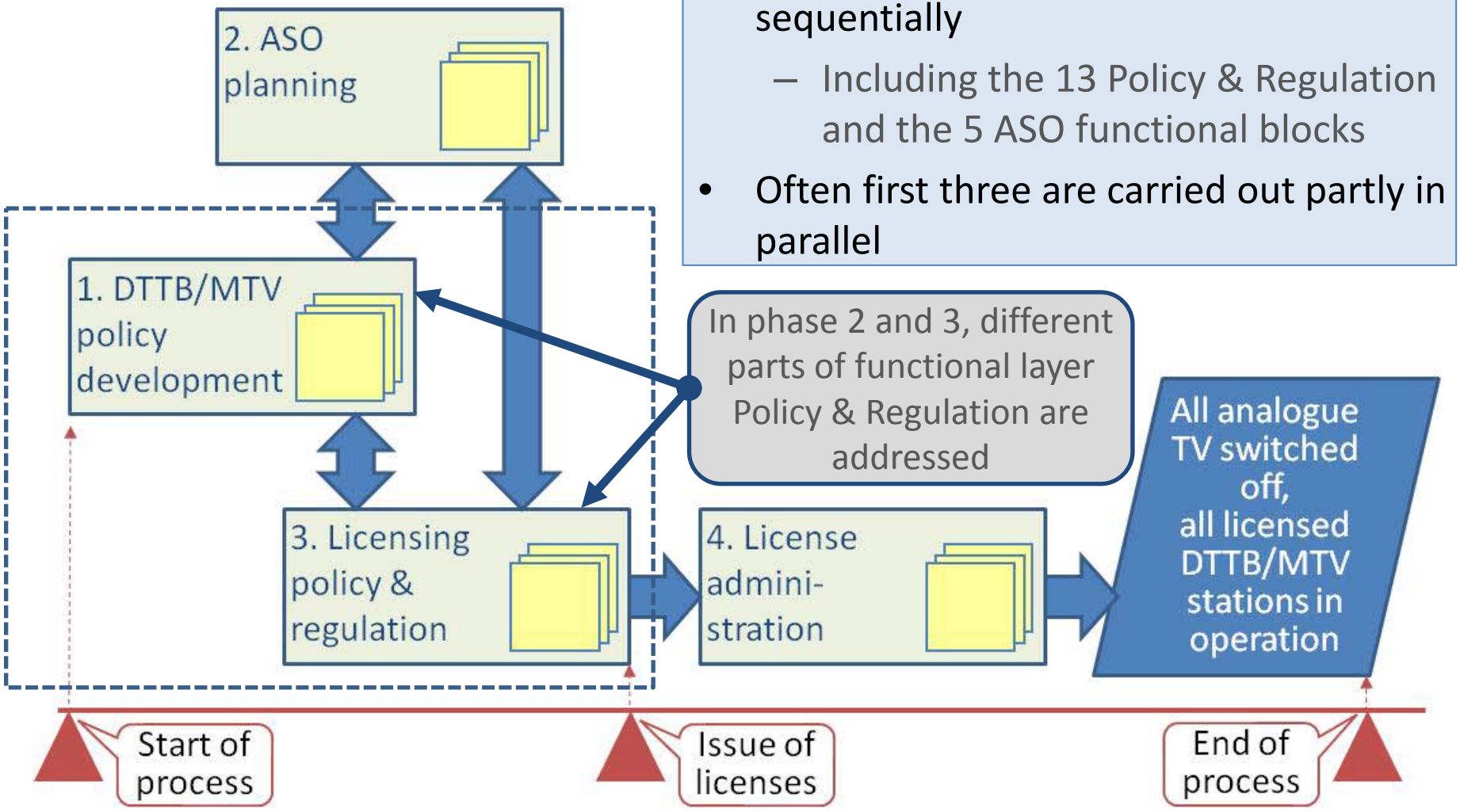
- Key issues and choices faced by the Regulator when formulating DTTB, MTV or ASO policy objectives
- Implementation of policies
  - By issuing information, funds, rights, licenses and permits to (qualified) market parties
  - In compliance with the relevant legislation

Functional building blocks

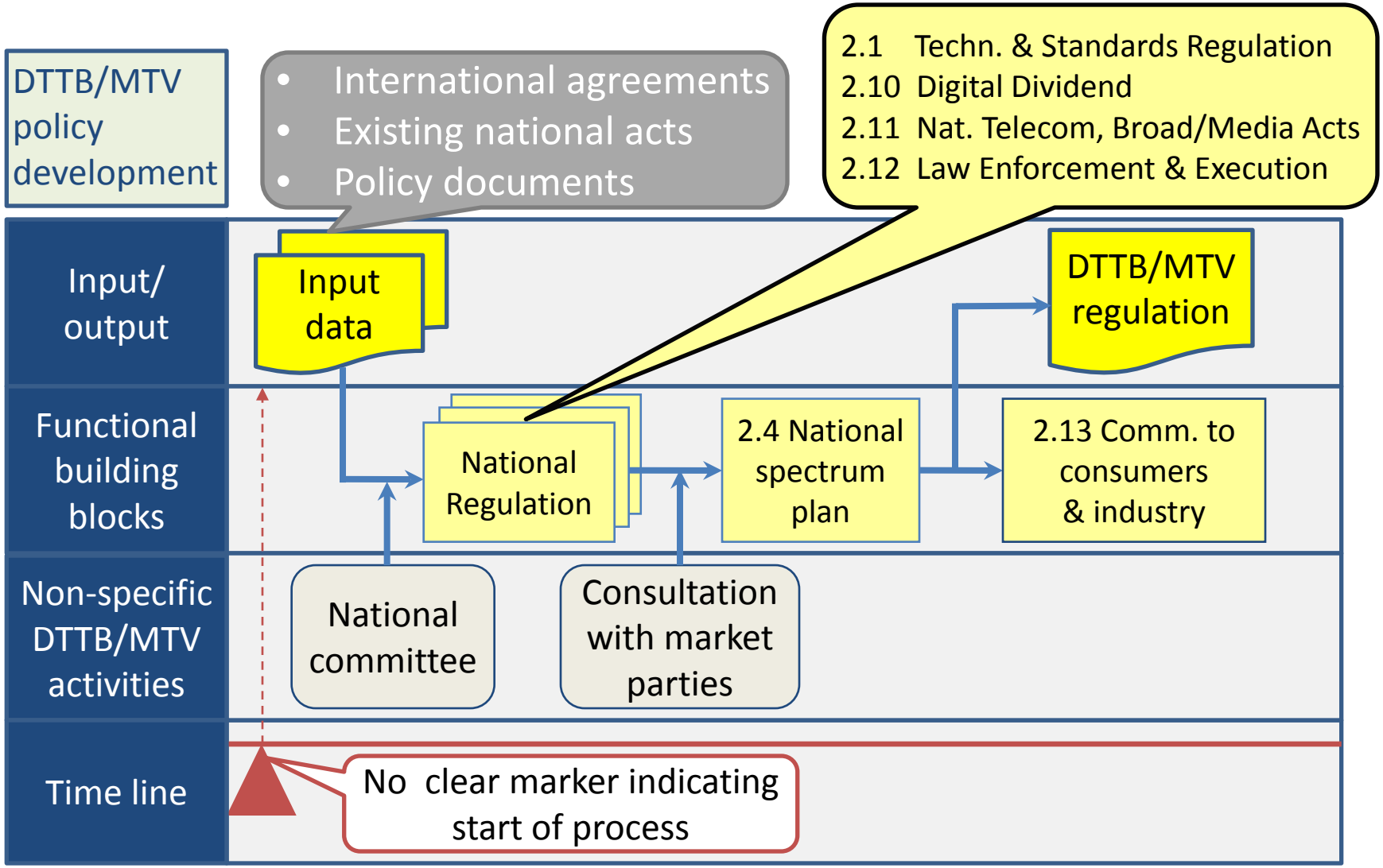
2.1. Technology & Standards Regulation	2.2. Licensing Framework	2.3. ITU-R Regulations		
2.4. National Spectrum Plan	2.5. Assignment Procedures	2.6. License Terms & Conditions	2.7. Local Permits (building & planning)	2.8. Media Permits & Authorizations
2.9. Business Models & Public Financing	2.10. Digital Dividend	2.11. National Telecom, Broadcast& Media Acts	2.12. Law enforcement & execution	2.13. Communication to consumers & industry

Regulator's roadmap

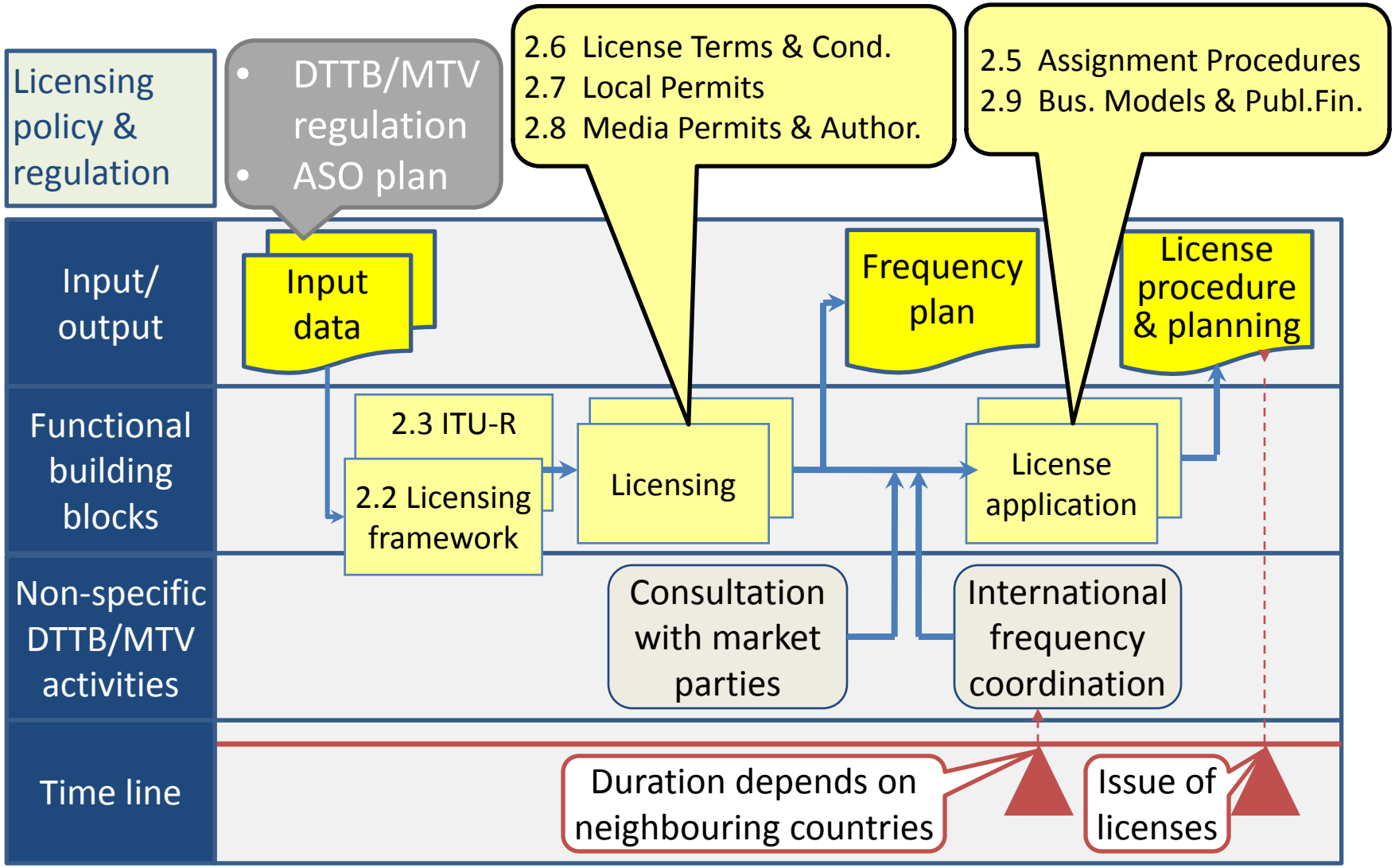
- The four phases can be carried out sequentially
  - Including the 13 Policy & Regulation and the 5 ASO functional blocks
- Often first three are carried out partly in parallel



Regulator's roadmap: Policy development (phase 1)



Regulator's roadmap: Licensing Policy (phase 3)



Conclusions Policy & Regulation

- Policy & Regulation for ASO and DTTB/MTV assignment can differ and coexist
  - ASO: services (& levels) are Government led
  - DTTB/MTV assigments: services (& levels) are market led
- Roadmap of the functional building blocks can vary from country to country
  - Local situation
  - Institutional/legal framework
- Functional building blocks are closely related
  - Roadmap execution is an iterative process

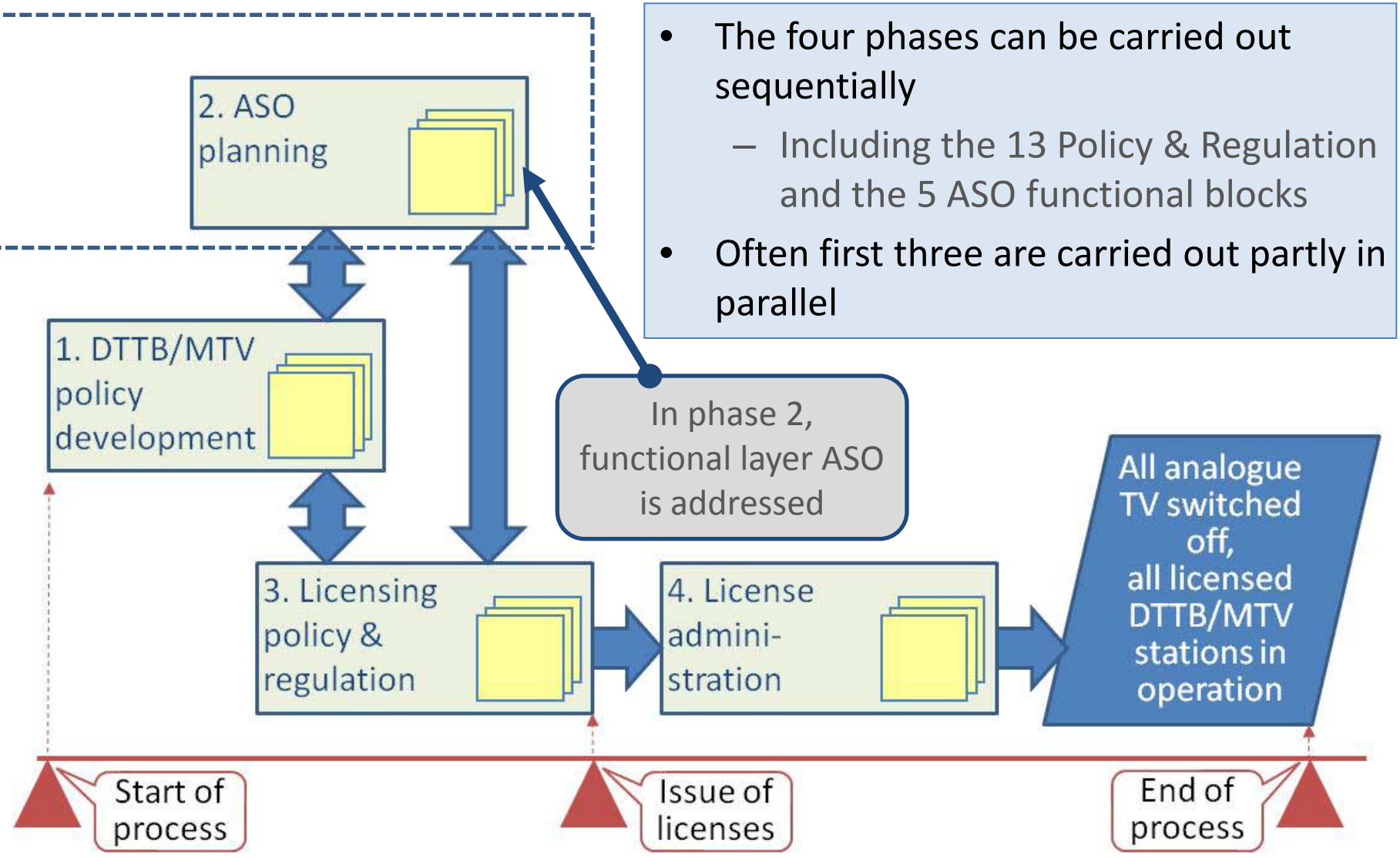
Layer B

Layer B Analogue switch-off (ASO)	• Process of turning off the analogue terrestrial television signal and replacing it with a digital signal • Government initiated policy, aiming at o More channels and services o New revenue streams and business models • The key objective in the ASO process is reducing the risk of service interruption

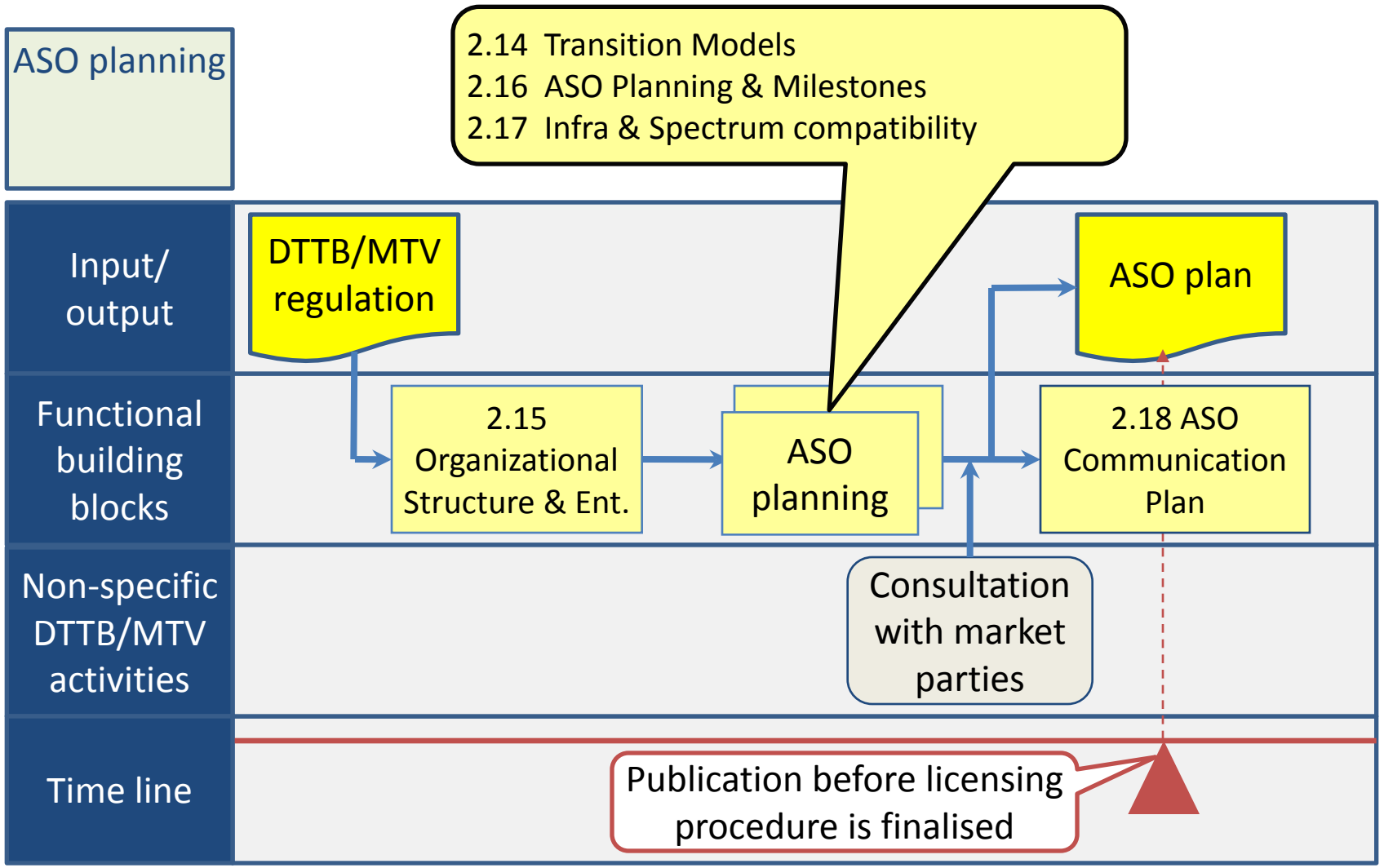
Functional building blocks					
	2.14. Transition Models	2.15. Organizational Structure & Entities	2.16. ASO Planning & Milestones	2.17. Infra & Spectrum Compatibility	2.18. ASO Communication Plan

Regulator's roadmap

- The four phases can be carried out sequentially
  - Including the 13 Policy & Regulation and the 5 ASO functional blocks
- Often first three are carried out partly in parallel



Regulator's roadmap: ASO Planning (phase 2)



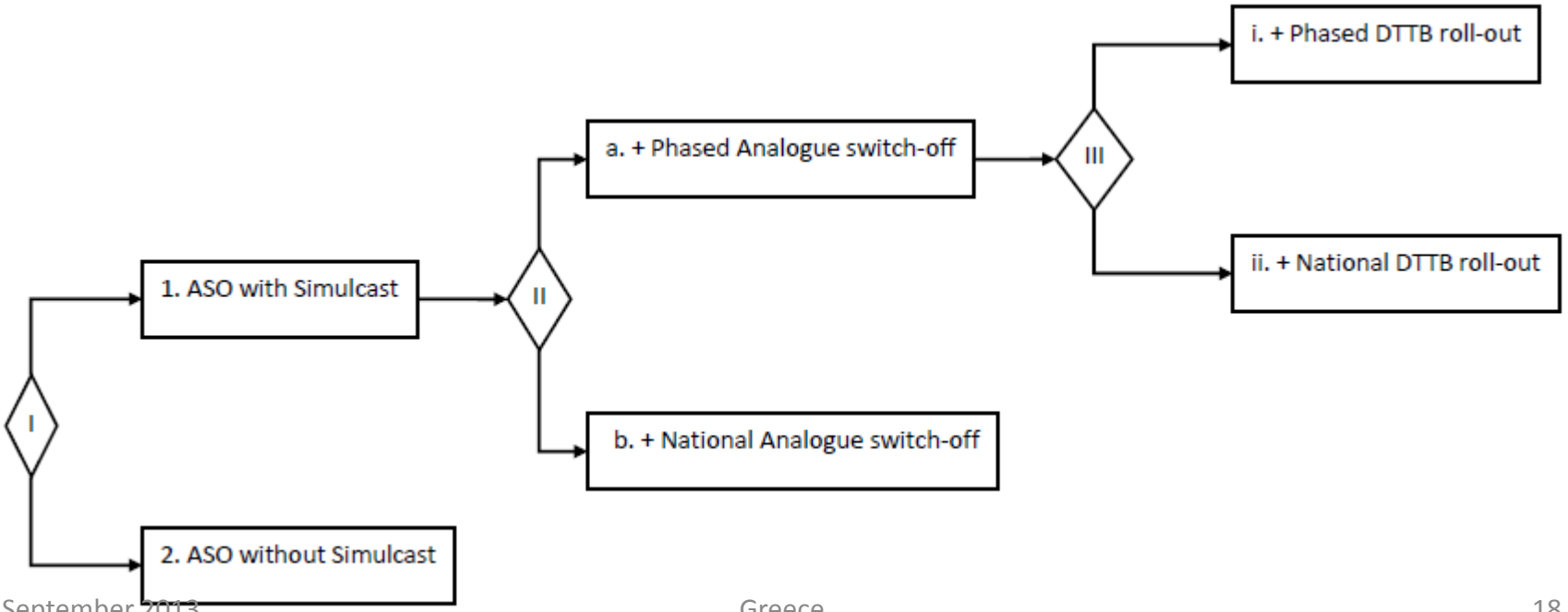
Transition Models (2.14)

ASO model factors

1. PSB services
2. # of analogue viewers
3. Spectrum availability
4. DTTB service uptake

Two basic ASO models

1. ASO with Simulcast:
   A. Phased
   B. National
2. ASO without Simulcast



Conclusions ASO

- ASO is Government initiated and led process:
  - Government is responsible for DTV service (& levels)
  - Government will incure (significant) costs
- ASO key decisions are:
  - Simulcast or not
  - When, where and how long
- ASO process requires timely & careful planning, esp. when simulcast & infra/spectrum incompatibility exist
- ASO Key Success Factors:
  - Coordination across value
  - Strong leadership
  - Effective communication
  - Sufficient financial resources

Layer C

Layer C

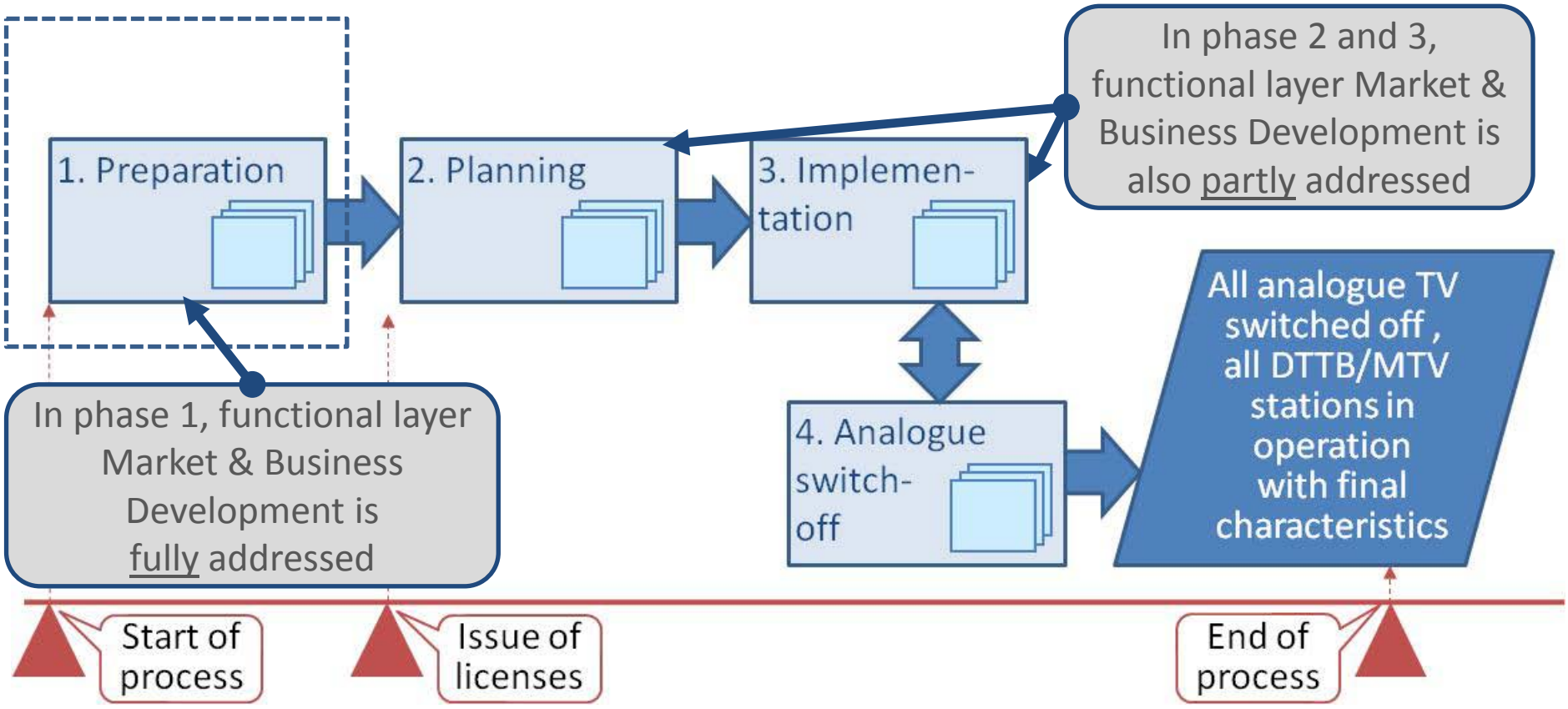
Market & business develop-ment

- Key business issues and choices faced by Service Providers/Network operators when planning the commercial launch of DTTB and MTV services
- A set of business activities and tools
  - For defining the DTTB/MTV service proposition and associated business case and plan
  - Taking into account demand drivers, service barriers, financial feasibility, receiver availability and customer support issues

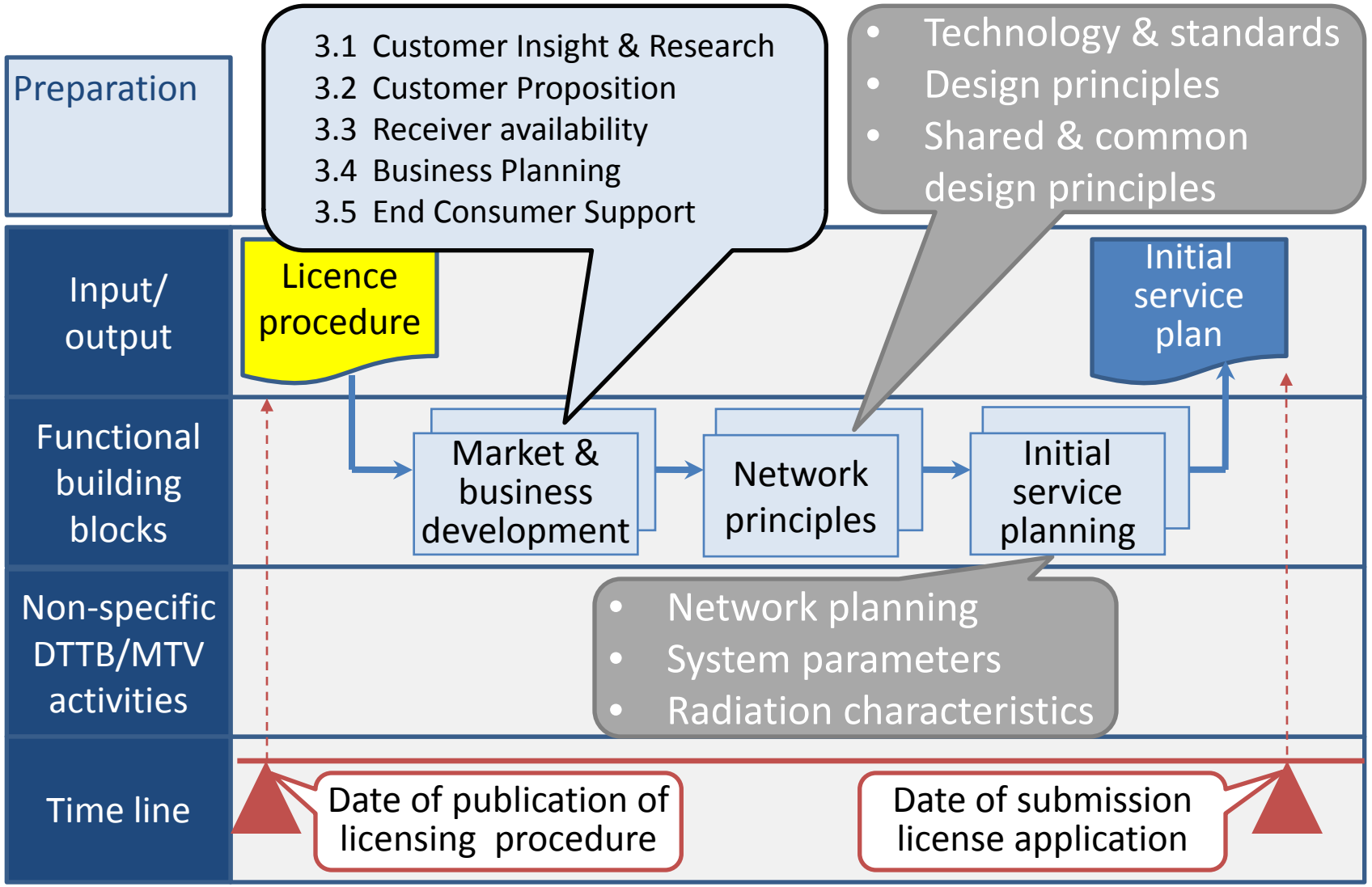
Functional building blocks					
	3.1. Customer Insight & Research	3.2. Customer Proposition	3.3. Receiver Availability Considerations	3.4. Business Planning	3.5. End Consumer Support

Operator's roadmap

- Phases 1, 2 and 3 are carried out sequentially
- Phase 4 is carried out partly in parallel to 3
  - With coordination to ensure compatible results



Operator's roadmap: M&B development (phase 1)



Business Planning (3.4)

- Business Planning process steps:
  1. Agreement on Business model
  2. Finalize Business Case
  3. Agreement on Business Plan (includes funding)
- Business Model driven by:
  - Type of Service (DTTB / MTV)
  - Market
  - Assignment Procedure
- DTTB 2 models: FTA / Pay
- MTV many different Business Models

Key factors to consider for FTA:
- Add. viewers or hours
- Ad market volume & TV share

Key factors to consider for Pay-TV
- Other bouquets in the market
- Existing FTA offers
- Exclusive contracts in market
- Willingness to pay

- Limited spectrum leads to shared MUX operations
- Service Provider = lead = Mobile Operator, Pay-TV operator, Broadcasters, etc.
- FTA in Japan/Korea = DTTB model
- Alternative platforms should be considered: Broadcasting and non Broadcasting (LTE)

Conclusions M&B Development

- Market & Business Planning also for Regulators to consider:
  - Business Model ↔ Assignment Procedure
  - Business Case ↔ Assignment Procedure
  - Service Proposition ↔ License T&C
- Market & Business Planning requires regulatory input → timely & comprehensive communications:
  - National Spectrum Plan
  - License procedure and T&C
- Business Planning process closely related to:
  - Network Planning process
  - Policy & Regulations process

Layer D DTTB Networks

Layer D

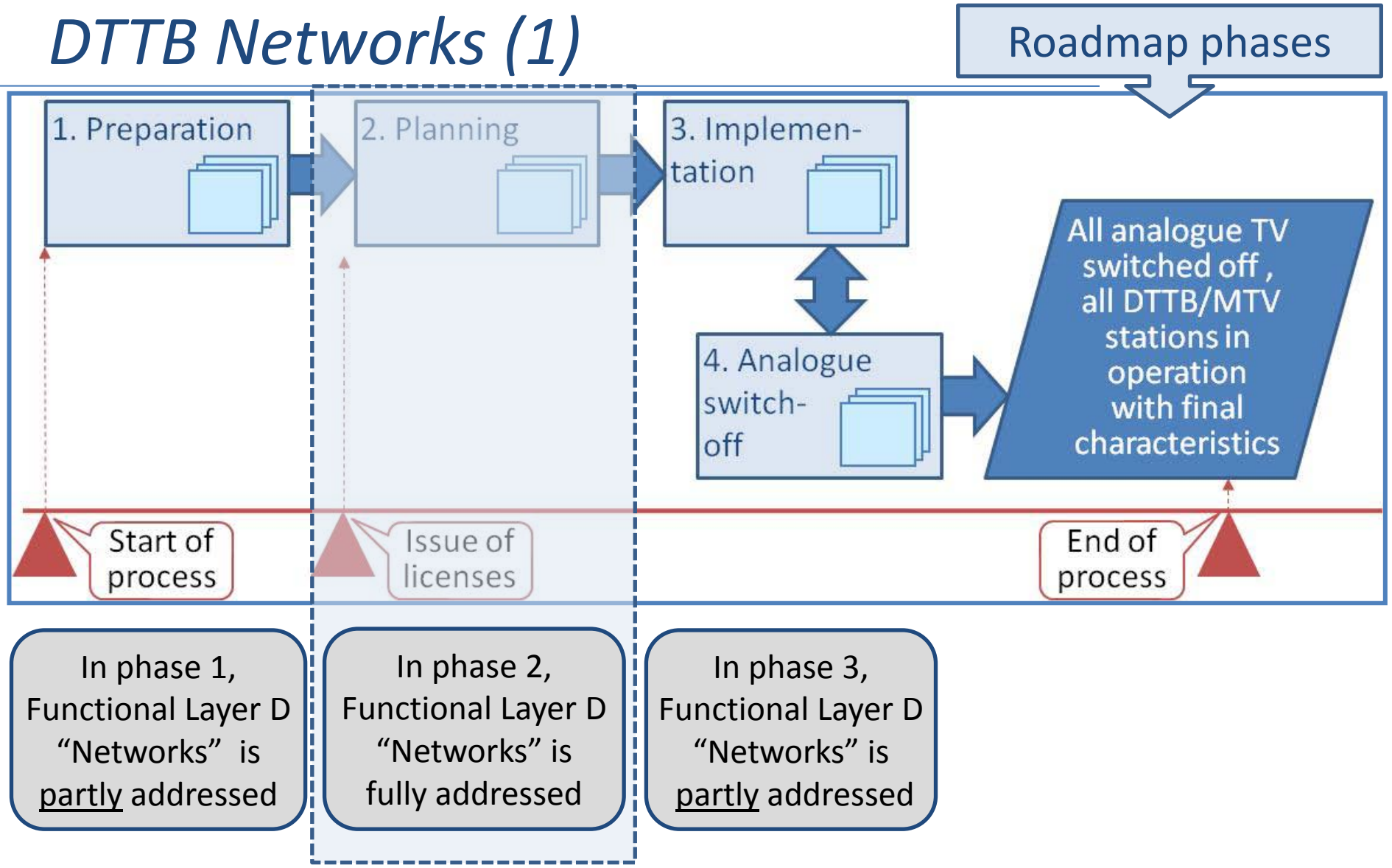
DTTB & MTV networks

- Key issues and choices faced by Network operators when planning transmitter networks for DTTB and MTV services
- Choices should be made within framework of
  - License conditions (including GE06 provisions, where applicable)
  - Business objectives

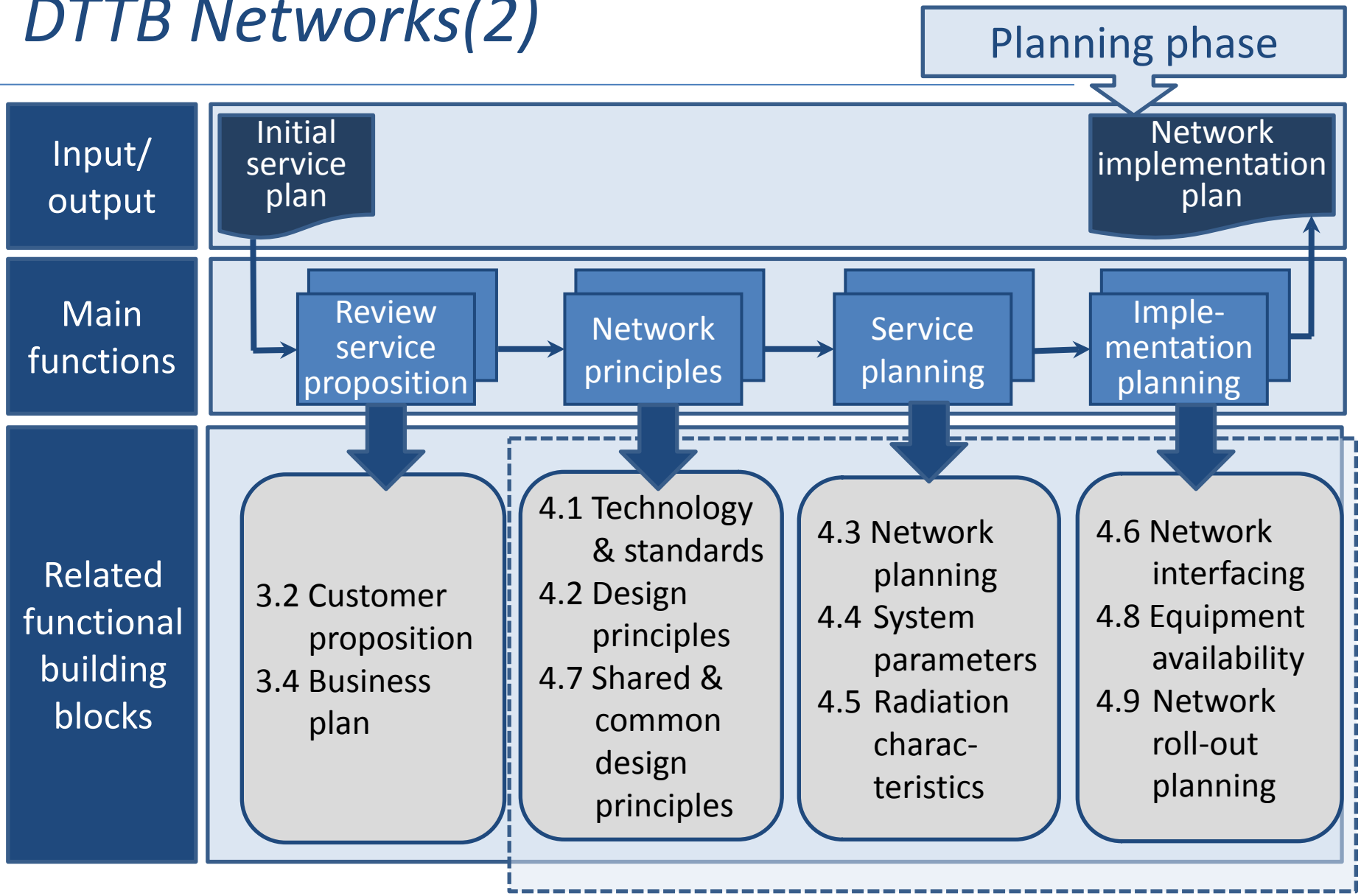
Functional building blocks

4.1. Technology & Standards Application	4.2. Design Principles & Network Architecture	4.4. System Parameters	4.6. Network Interfacing	4.8 Transmitting equipment Availability	4.9 Network Rollout Planning
4.3/5.3. Network Planning	4.5/5.5 Radiation Characteristics	4.7/5.7 Shared & Common Design Principles			
5.1. Technology & Standards Application	5.2. Design Principles & Network Architecture	5.4. System parameters	5.6. Network Interfacing & studio facilities	5.8 Transmitting equipment Availability	5.9 Network Rollout Planning

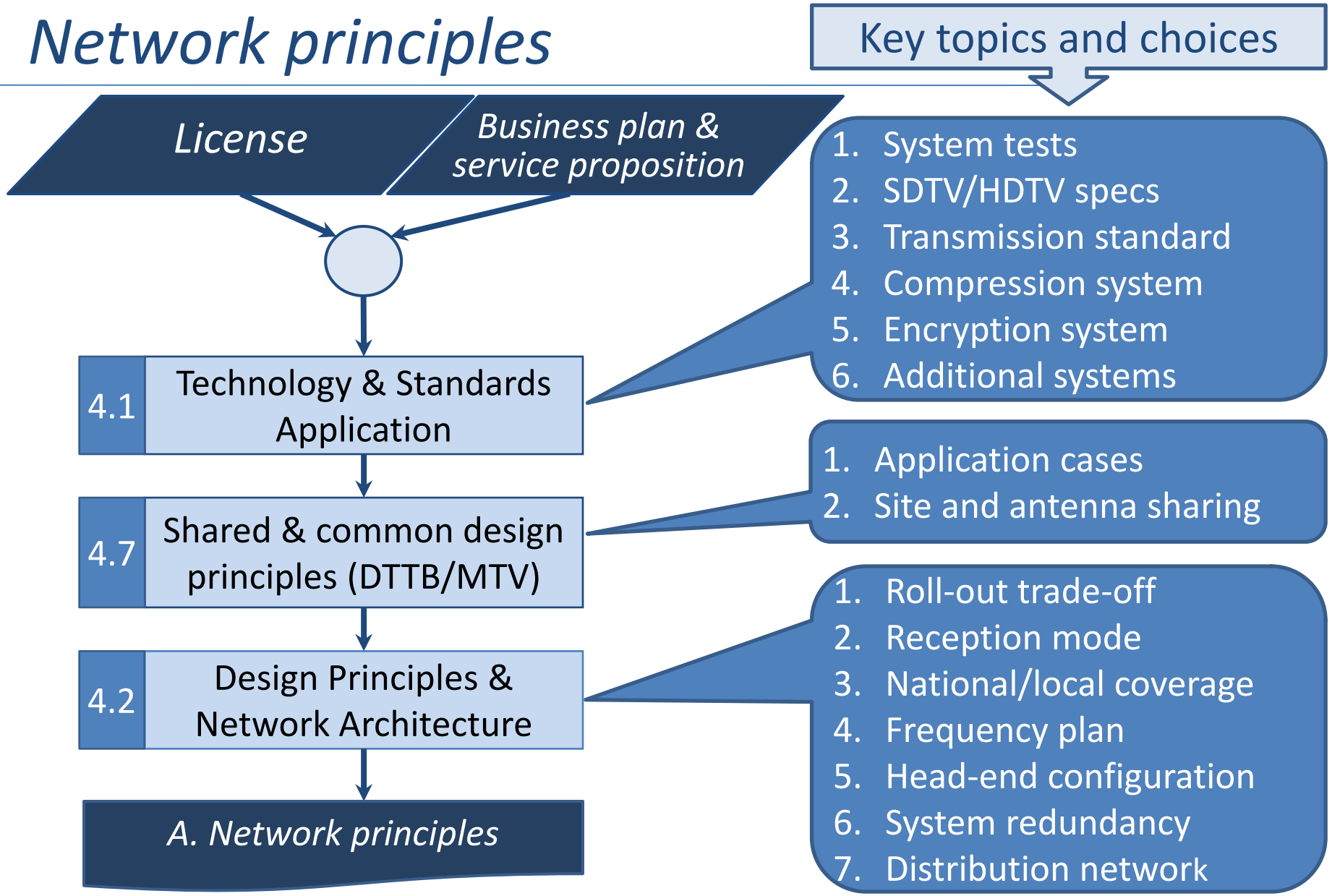
DTTB Networks (1)



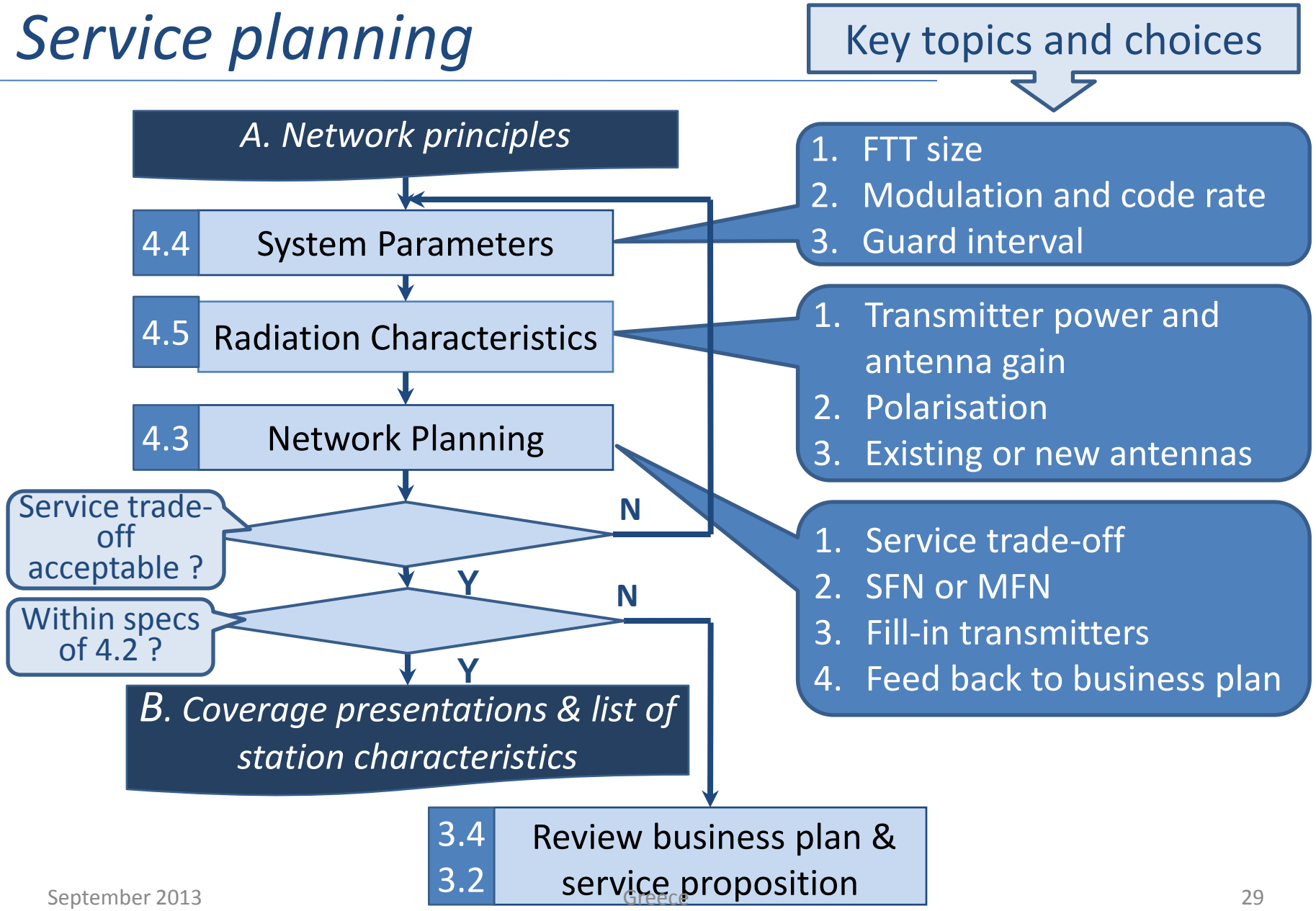
DTTB Networks(2)



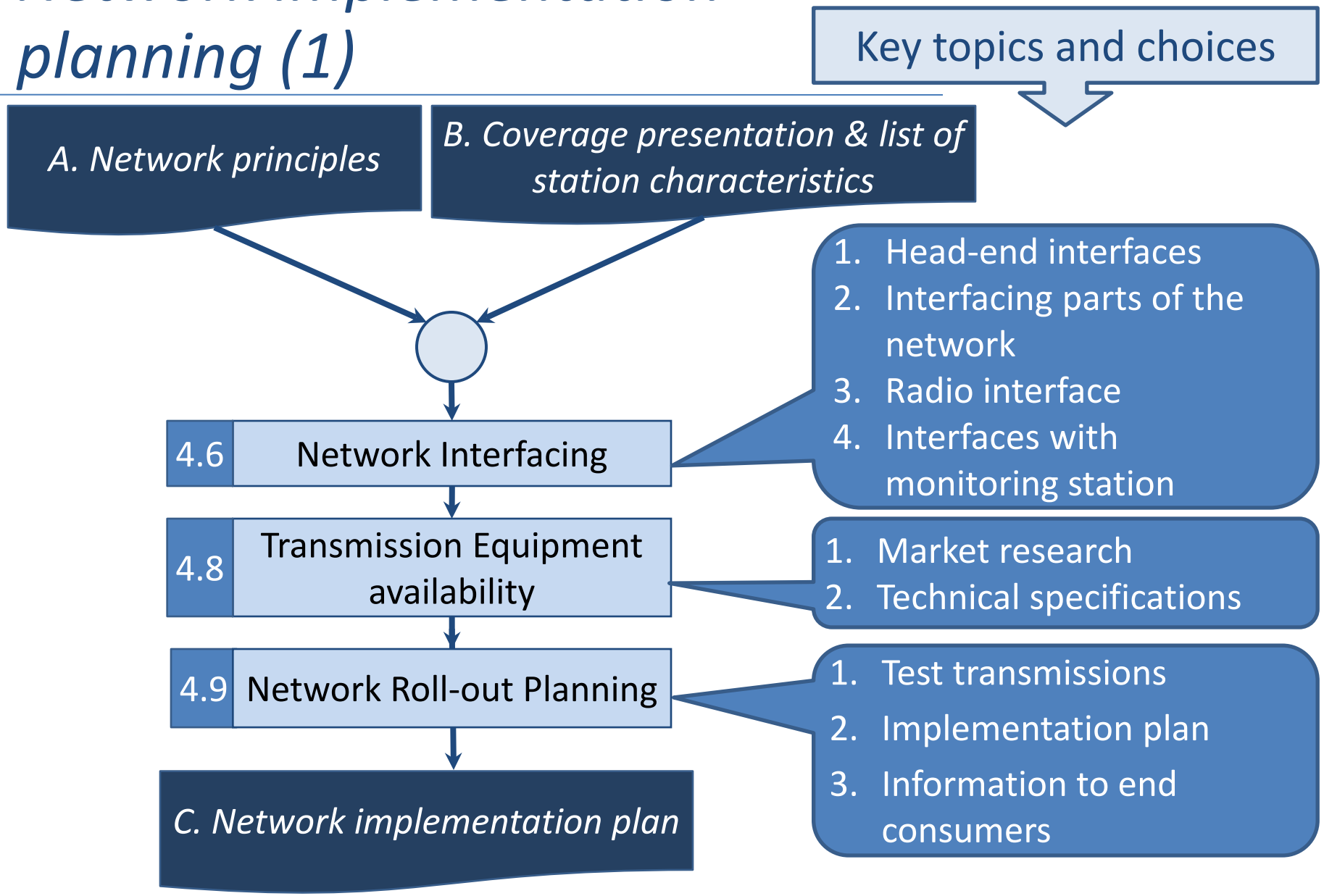
Network principles



Service planning



Network implementation planning (1)

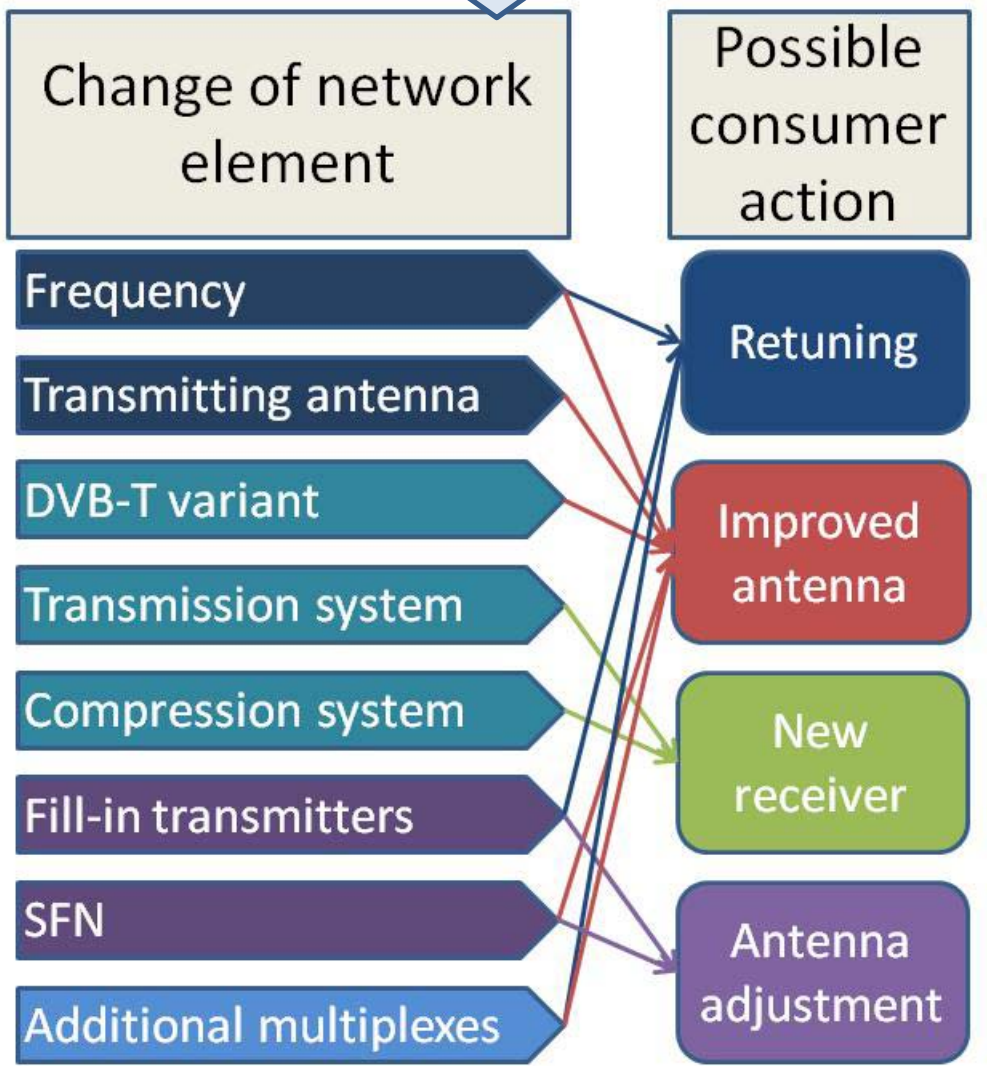


Network implementation planning (2)

End consumer information

- Consumer information based on realistic data of
  - Coverage
  - Service quality
  - Implementation schedules
- Changing of several network elements has impact on reception
- Consumer may have to adjust, modify or replace parts of receiving installation

Examples of impact on reception



Conclusions DTTB networks

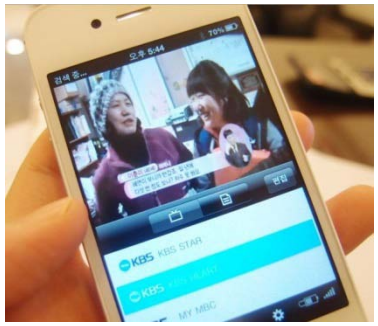
Three major documents have to prepared	A. Description of network principles B. Collection of coverage presentations and list of station characteristics C. Network implementation plan
Key topics and choices to be considered	• Nine functional building blocks • 36 key topics and choices • Choices should be made in such a way that: o License conditions are fulfilled (including GE06 provisions) o Business objectives are met o Optimum solutions be found between often conflicting requirements regarding picture and sound quality, coverage quality and transmission costs

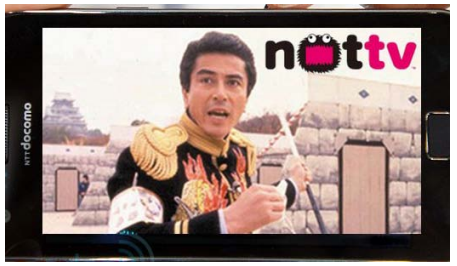
Layer D – MTV networks

Layer D

MTV Networks

- Key issues and choices faced by Network Operators when planning transmitter networks for MTV services
- Choices should be made within framework of
  - Licence conditions
  - Business objectives

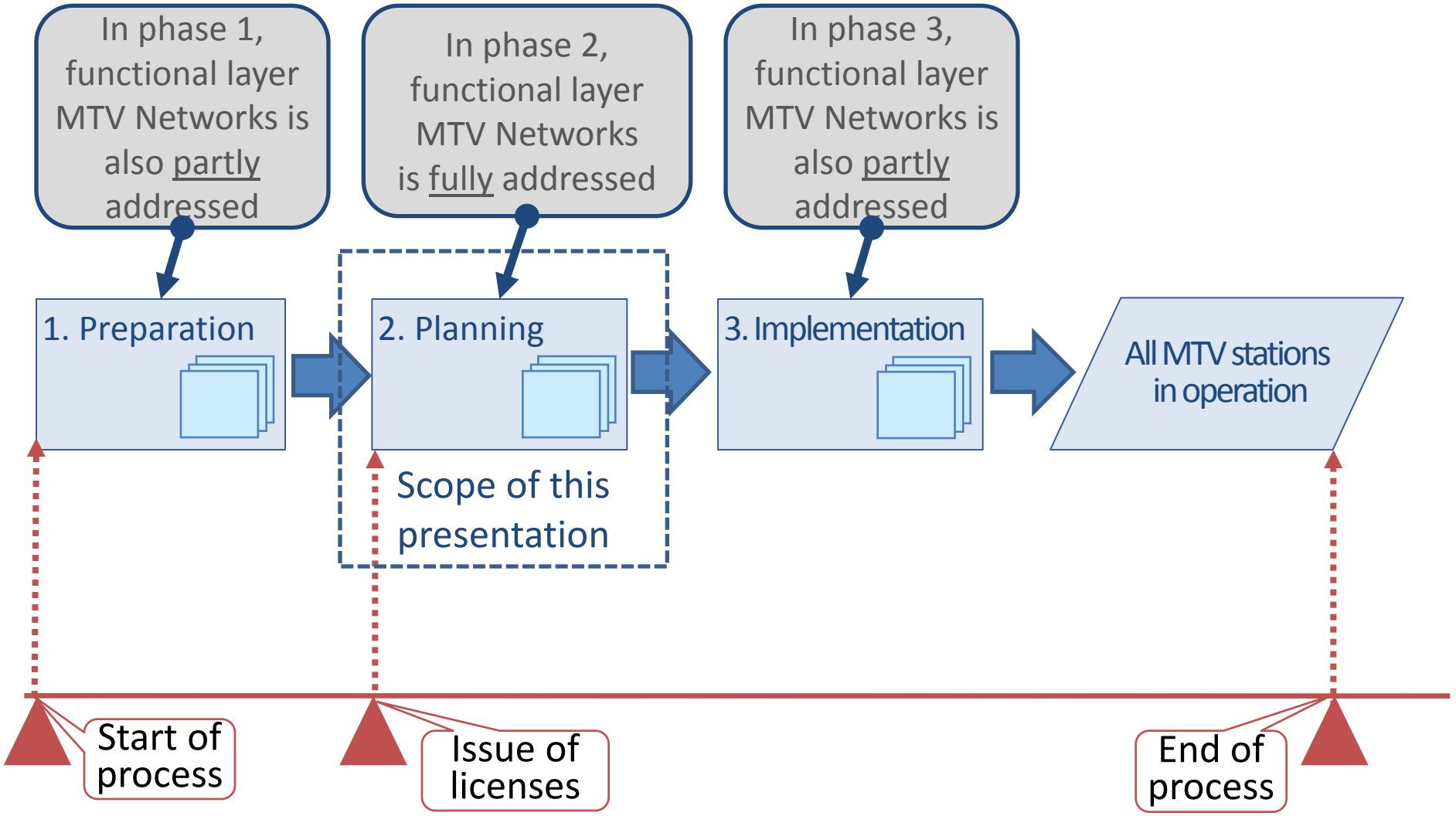




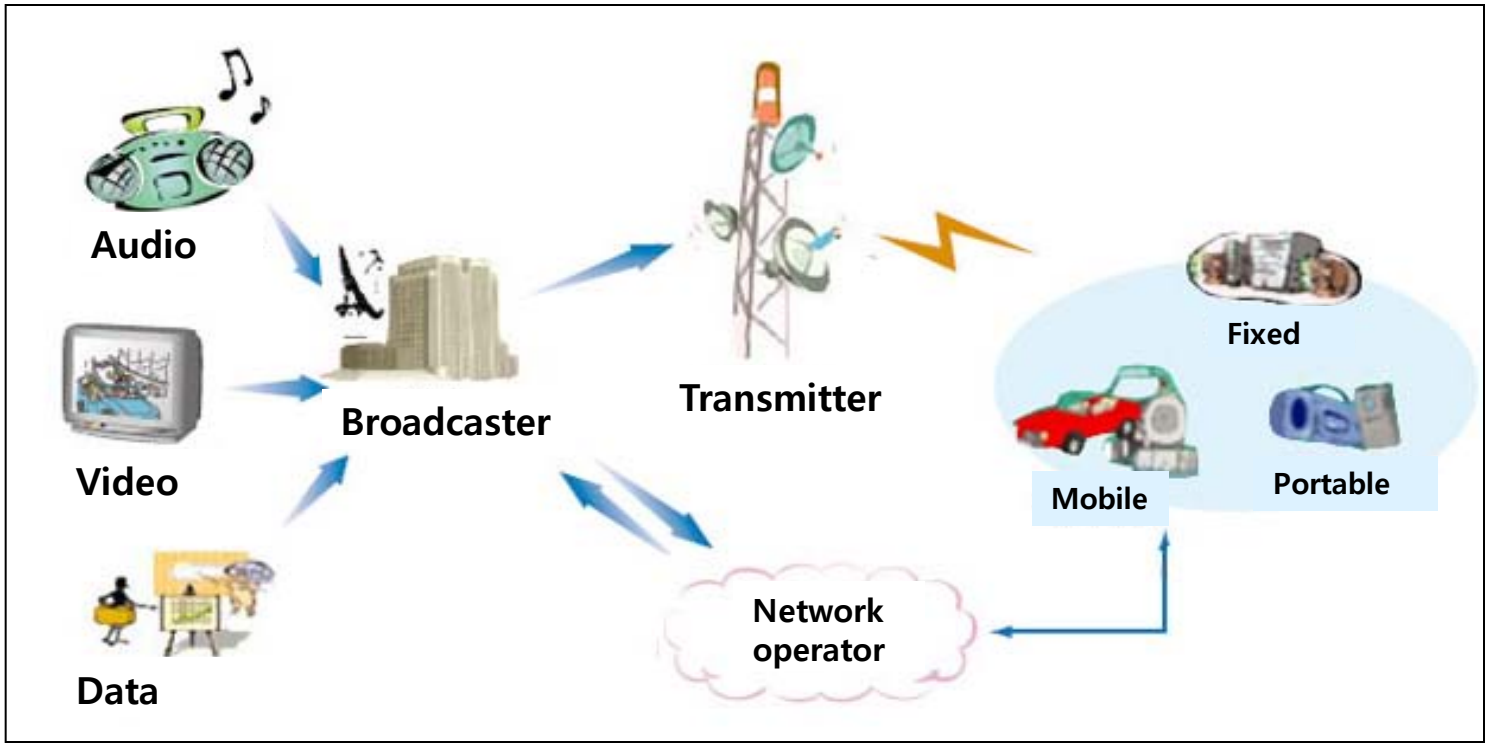
Main issues

- Scope of presentation
- What is MTV?
- Network principles
- System implementation
- Service roll out
- Conclusions

Roadmap MTV network operator



What's the MTV? : Concept



- Broadcasters: provide multimedia services (Video, Audio and Data)
- Audiences: can consume various services anywhere (Fixed, Mobile, and Portable)
- Features:
  - Mobile receiving: Anywhere, complementary services of existing media
  - Personalisation: Small screen, high royalty
  - Activation: Participation in program, M-commerce, additional information

What's the MTV? : Status worldwide

T-DMB

- **Commercial Service :**
  Korea / Ghana / Norway / France (Digital Radio)
- **Trial Service :**
  Mongolia / South Africa/ Cambodia / Laos, etc.

http://www.t-dmb.org/
http://www.worlddab.org/

ISDB-T

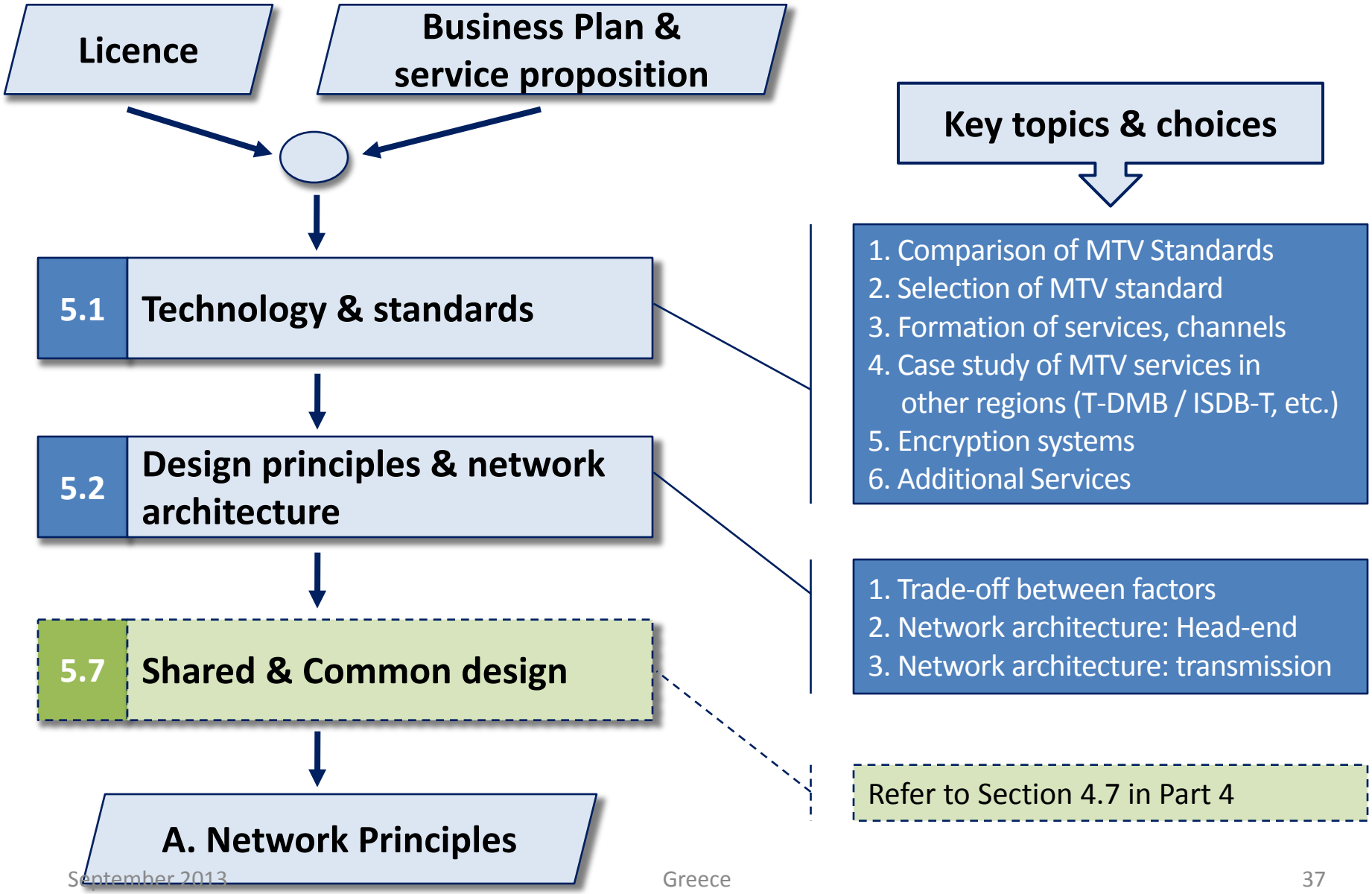
- **Commercial Service :**
  Japan / Brazil / Argentina / Peru / Venezuela, etc.
- **Trial service :**
  Ecuador / Chile / Uruguay/ Botswana, etc.

http://www.dibeg.org/
http://www.arib.or.jp

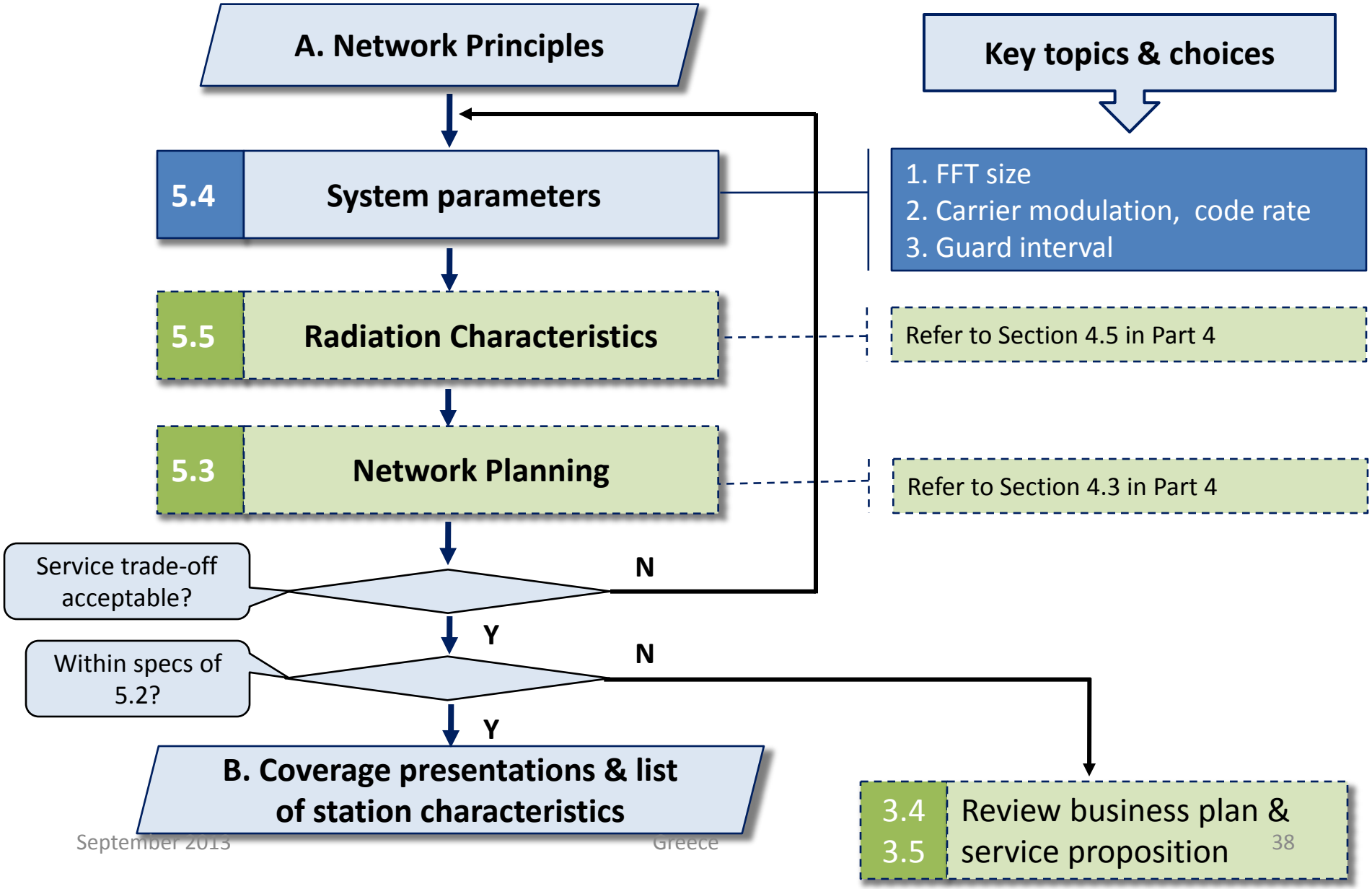
Others

- **DVB-T2 Lite**
  http://www.dvb.org
- **ATSC- M/H**
  http://www.atsc.org/cms/

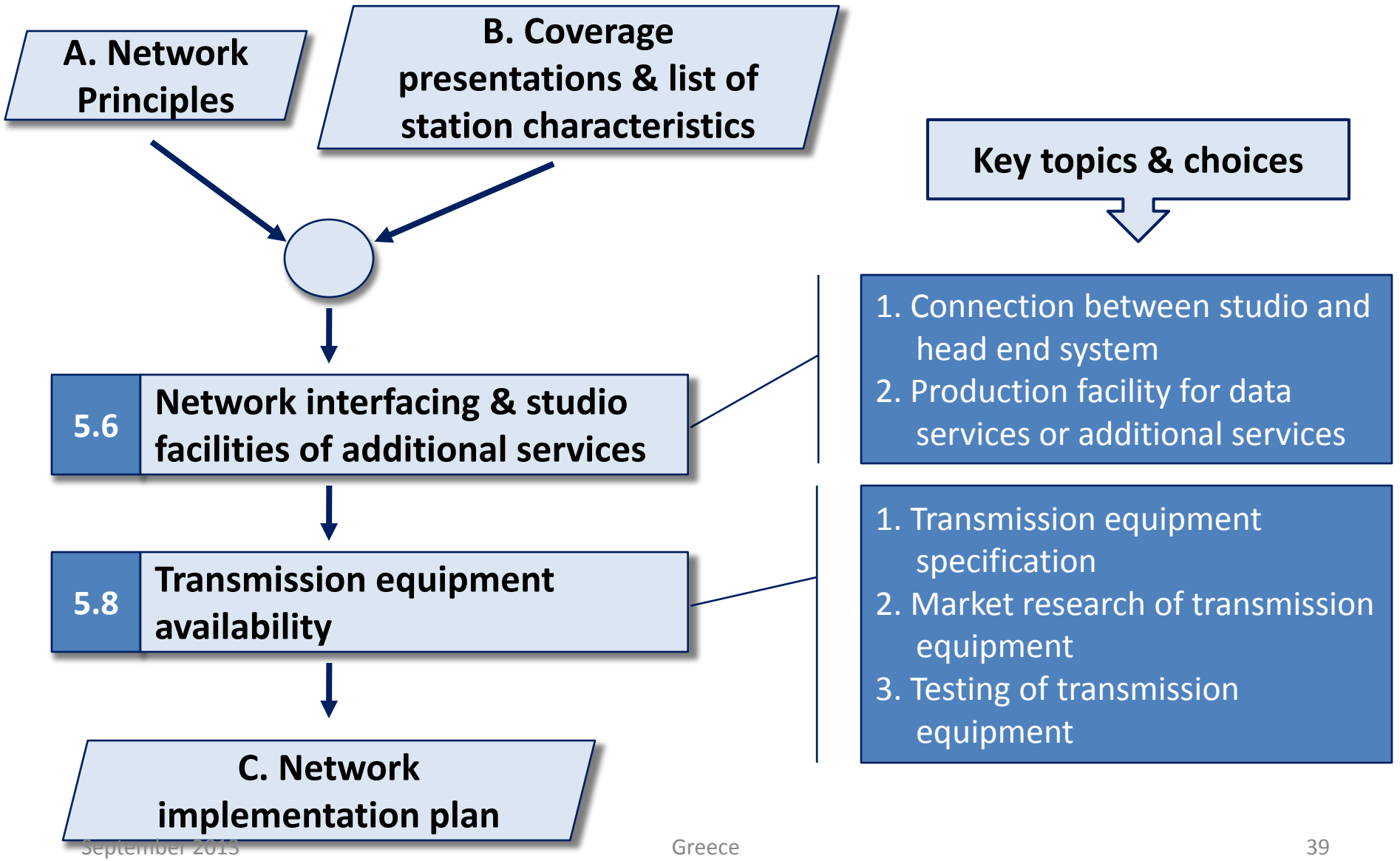
Network principles



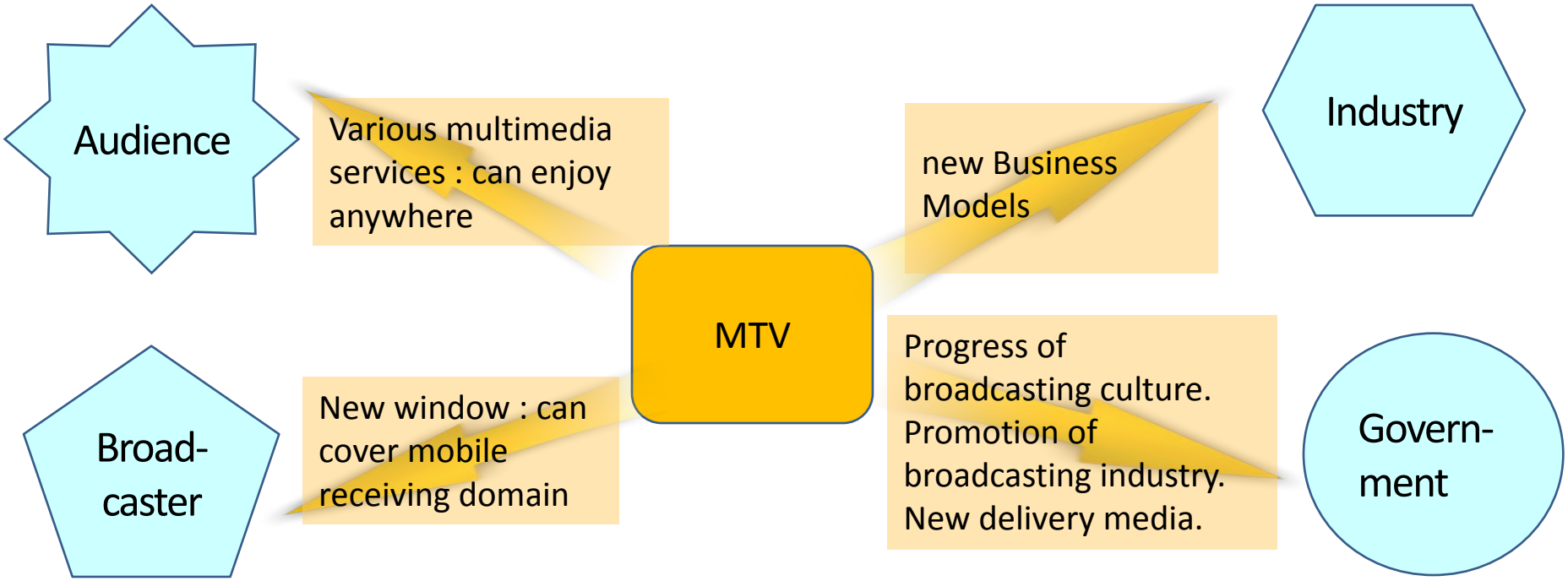
System implementation (1)



System implementation (2)



Conclusion related to MTV networks



- Choose the technical standard in accordance your country's situation (frequency spectrum / target coverage, etc.) and the goals of MTV introduction (No. of channels / profitability, etc)
- Field test(technical aspects) and audience research(programs and revenue aspects) are necessary for successful launching of MTV
- In addition, establishing a cooperative structure with manufactures and telecom operators is an essential element for soft landing of MTV and rapid growth of MTV

Layer E

Layer E

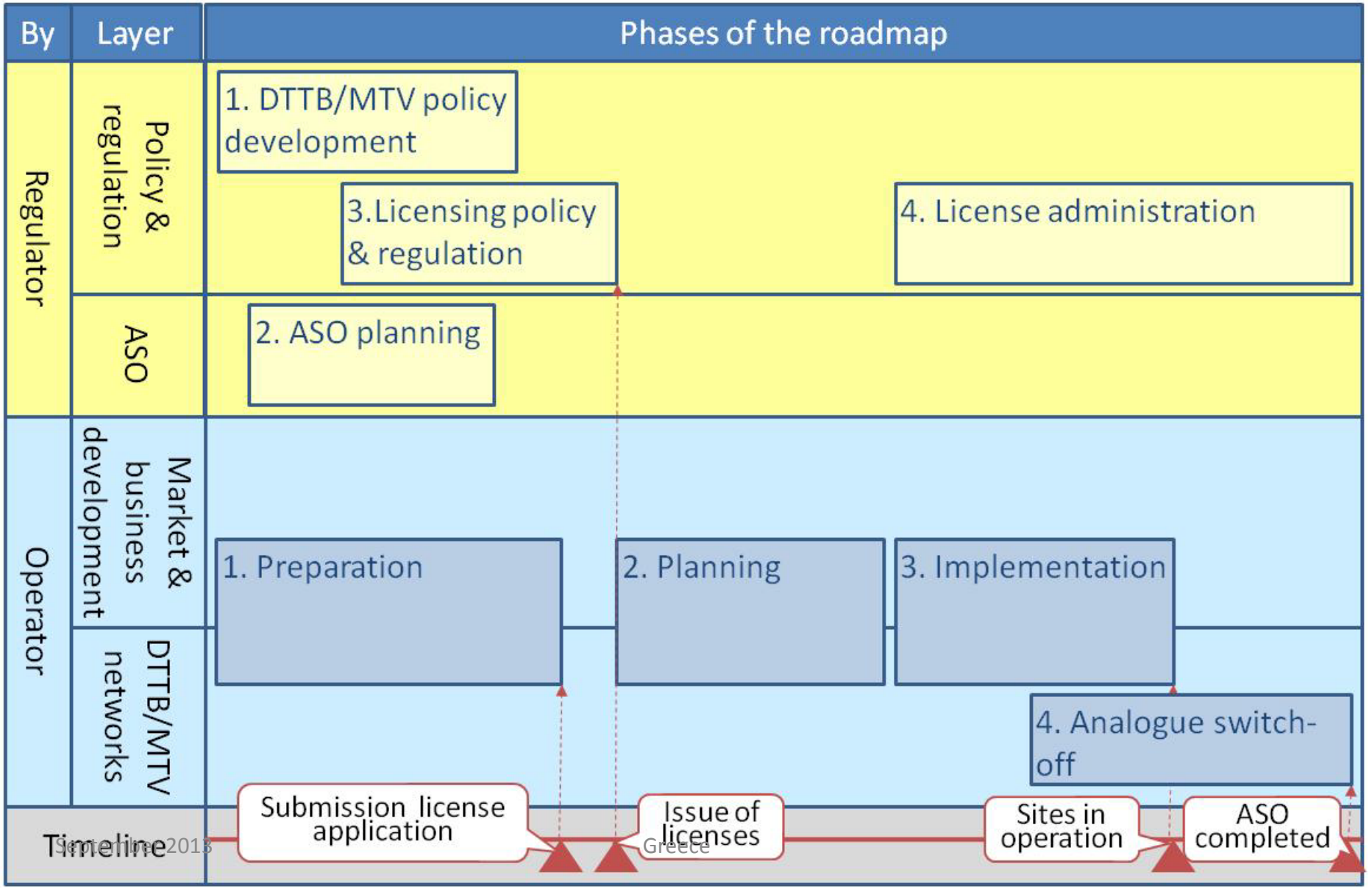
Roadmap development

- Development of generic roadmaps regarding the whole process of transition to DTTB and introduction of MTV
  - Matching short-term and long-term goals
  - Indicating the main activities to meet these goals

Functional building blocks

6.1.DTTB/MTV Roadmap example for regulator	6.2 DTTB Roadmap example for operator	6.3 MTV Roadmap example for operator

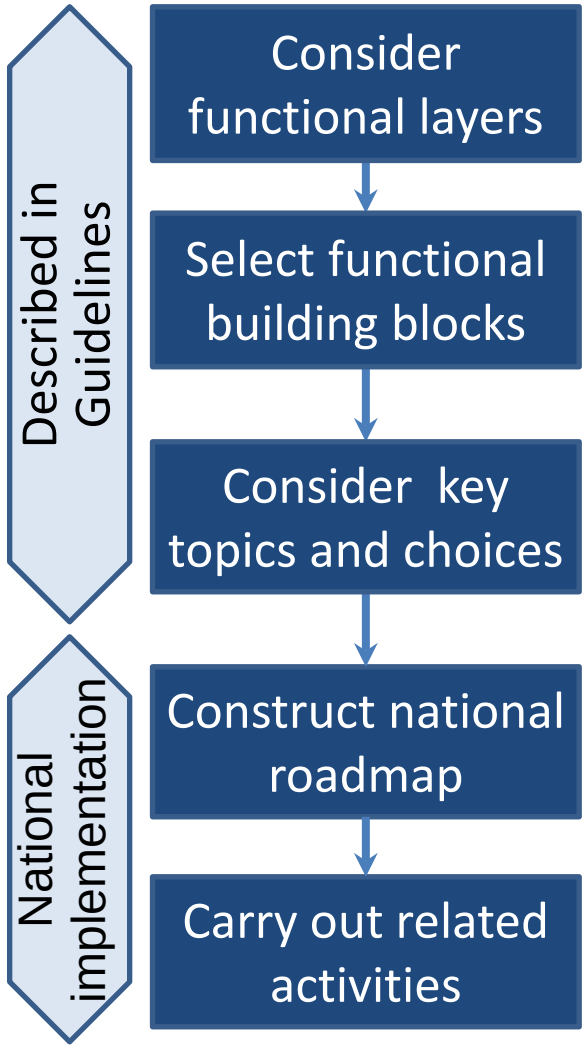
Example roadmap phases



National roadmap development

Defining current situation and aim of the roadmap	• Market analysis
	  o Current TV market structure
	  o TV networks
	  o Regulatory framework
	• Specifying DSO objectives

Scoping the roadmap	• Selection of the relevant functional building blocks • Determining the roadmap phases • Considering key topics and choices
Roadmap construction and implementation	• Placing the functional building blocks in a logical order and in a timeframe • Carrying out the activities identified in each of the functional building blocks



Roadmap construction (1)

Seven steps to construct a national roadmap

1	Analysis of TV market structure, current TV networks and regulatory framework	Tool for assessing the market position of the new DTTB and MTV services
2	Formulation of Digital- Switch-Over objectives	Identification of the aim or end milestones of the roadmap o Often during and after transition
3	Selection of the relevant functional building blocks and determining the phases of the roadmap	Scoping of the roadmap o Supplement with main activities not specific to DTTB & MTV
4	Considering the main topics and choices of each of the functional building blocks	Determining topics that have been decided, partly decided, not decided yet or need review

Roadmap construction (2)

Seven steps to construct a national roadmap (cont.)

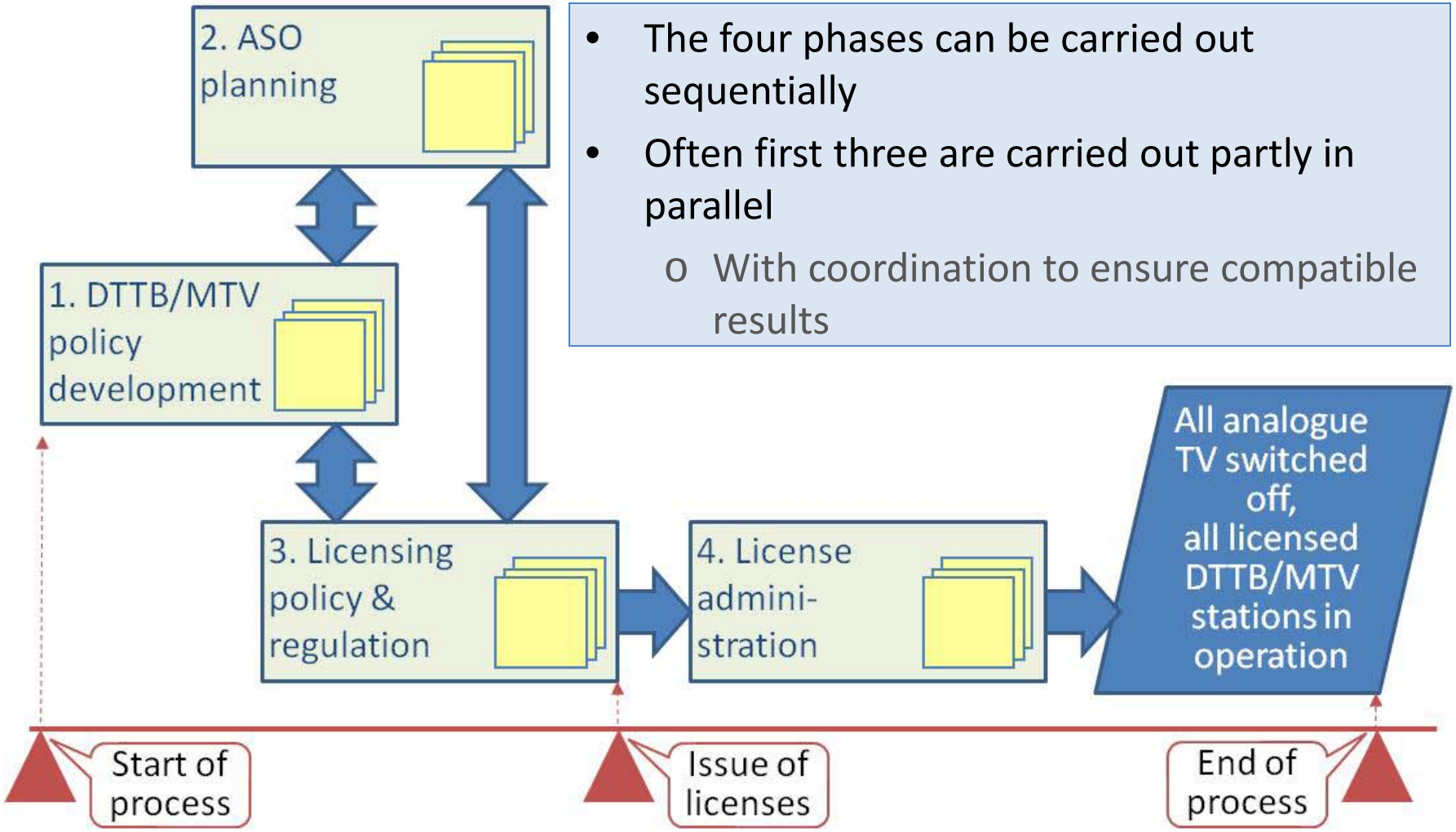
5	Place functional building blocks in logical order and time frame	Establish realistic time schedules o Coordination of sequence and time frame between players
6	Determine the main activities needed to conclude on topics that have not or not fully been decided	Activities to be carried out within the timeframe given by the roadmap
7	Select the top-10 or top-5 most critical issues to be considered	Focusing attention on the main topics o Topics could relate to more than one functional building block

Roadmap construction (3)

Example of the structure of the roadmap report

Introduction	Background and organization for which roadmap has been made
Current TV market and DSO objectives	National market structure, Regulatory framework and Digital-Switch-Over objectives
National roadmap	Selected functional building blocks placed in order and time and description of the roadmap per phase
Top 10 (5) most critical key topics and choices	Description of impact on transition of these topics; topics could relate to several functional building blocks
Recommendations	Strategic decisions for a smooth transition to digital TV and switching-off analogue TV
Status of functional building blocks per phase	Decisions on the key topics and choices and description of main activities related to these activities
Examples of roadmap reports prepared with ITU assistance	In Asia-Pacific region and Africa; see website ITU-D/technology pages/project on digital broadcast transition

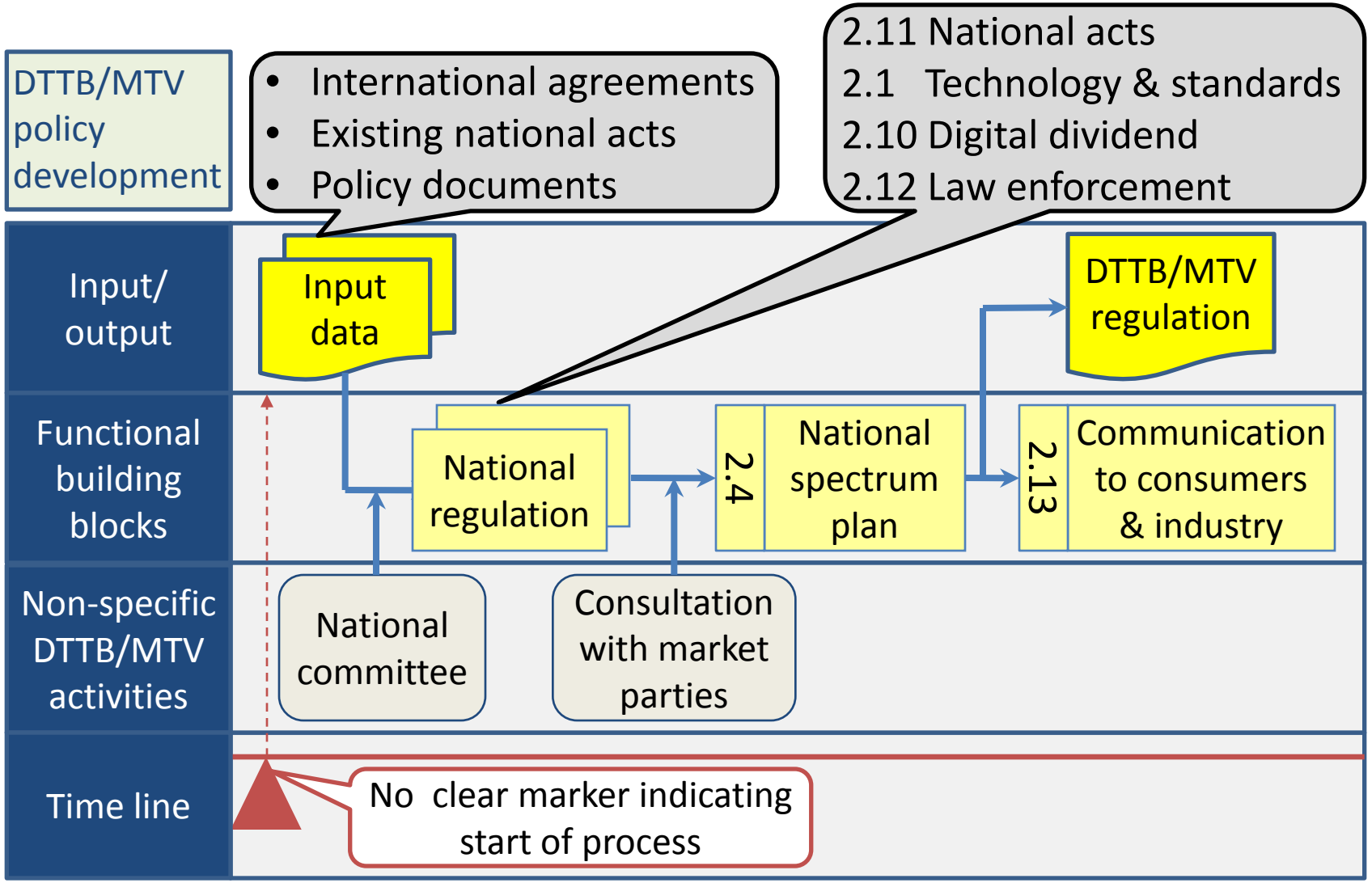
Generic regulator's roadmap (1)



- The four phases can be carried out sequentially
- Often first three are carried out partly in parallel
  - With coordination to ensure compatible results

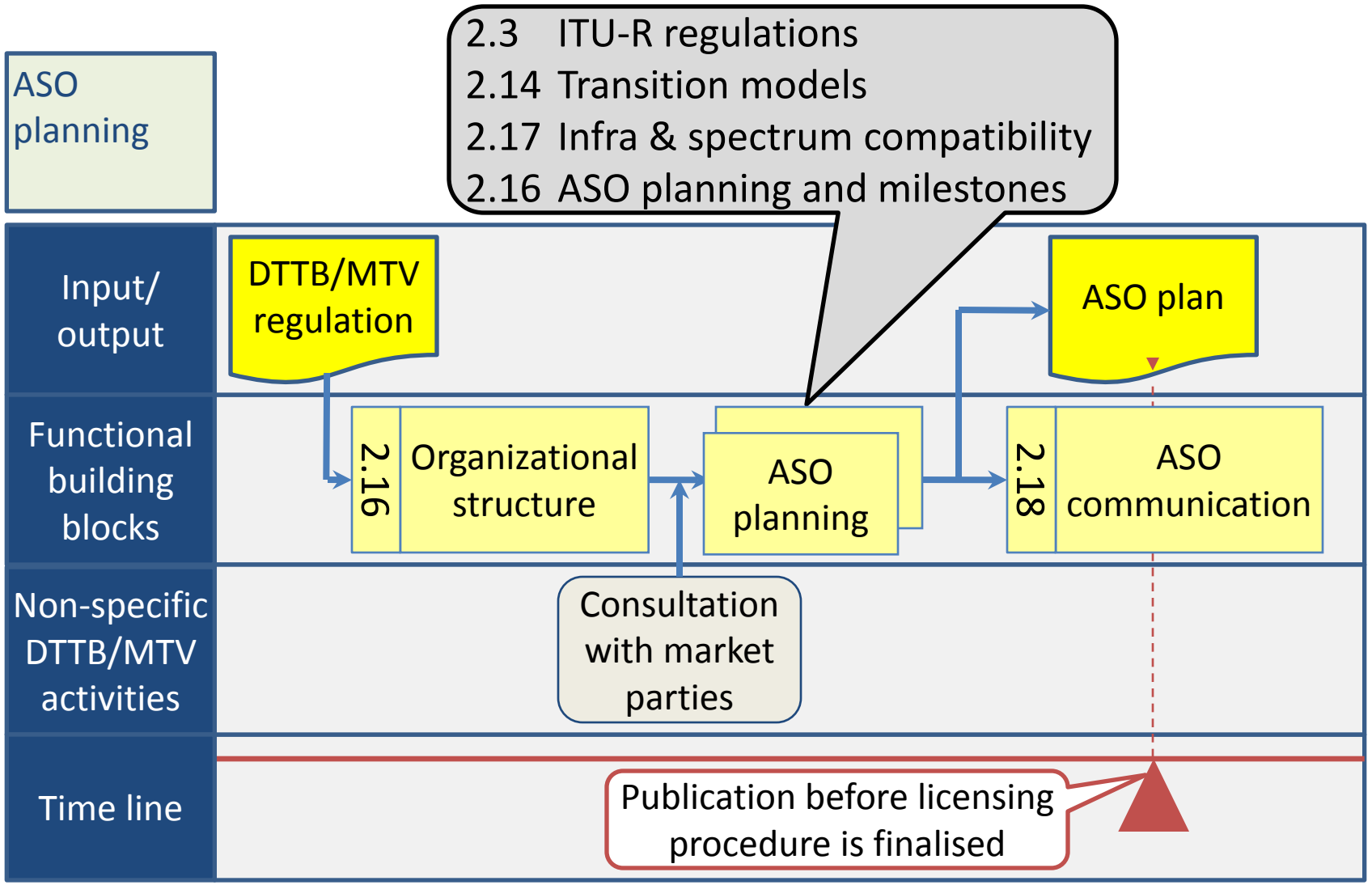
Generic regulator's roadmap (2)

Phase 1: DTTB/MTV policy development



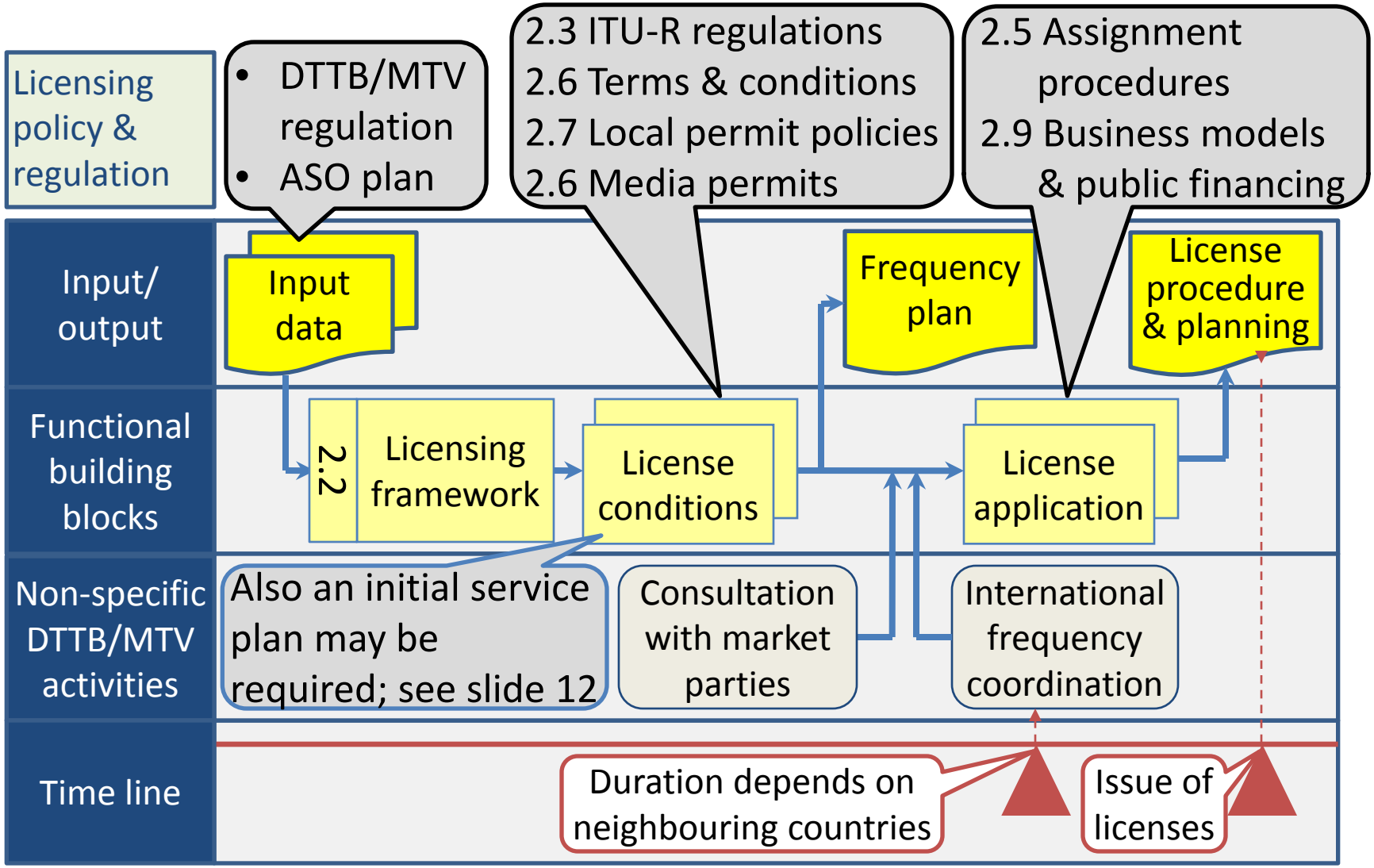
Generic regulator's roadmap (3)

Phase 2: ASO planning



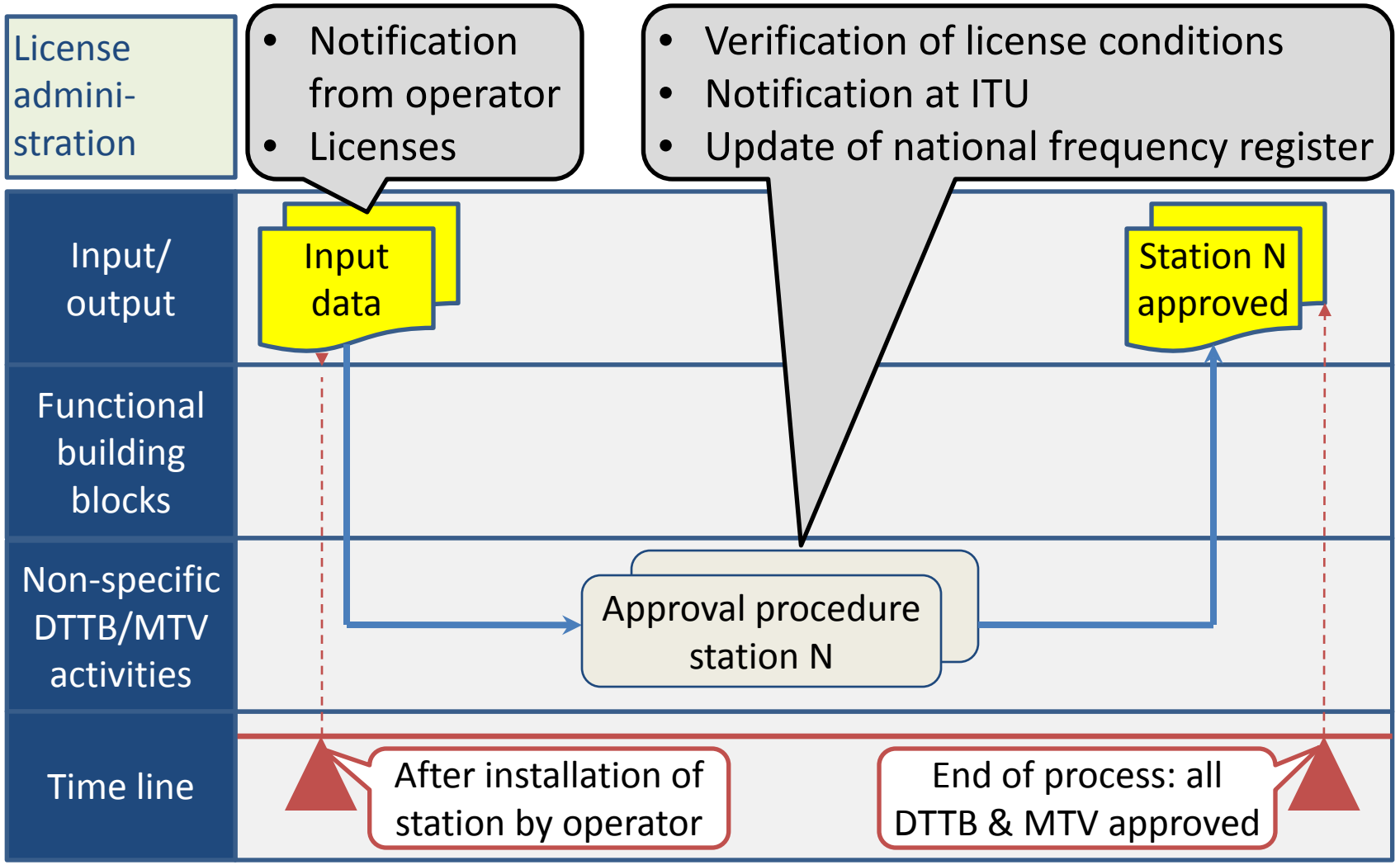
Generic regulator's roadmap (4)

Phase 3: Licensing policy & regulation



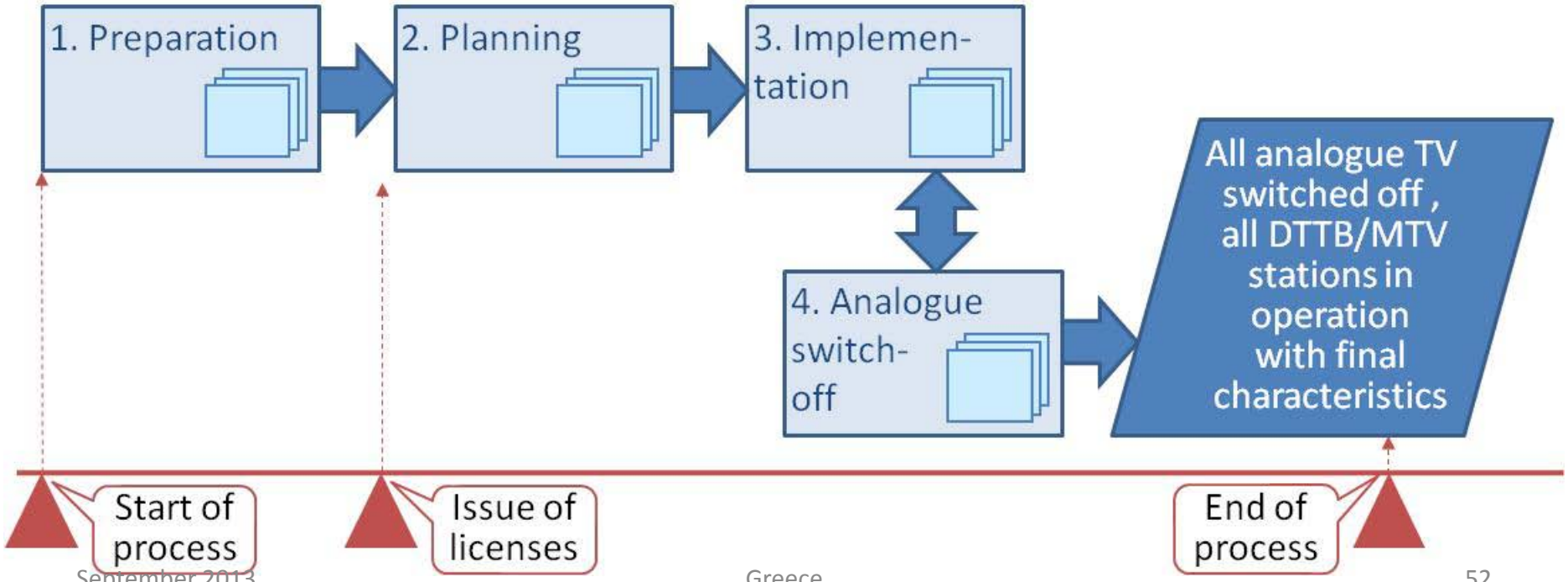
Generic regulator's roadmap (5)

Phase 4: License administration



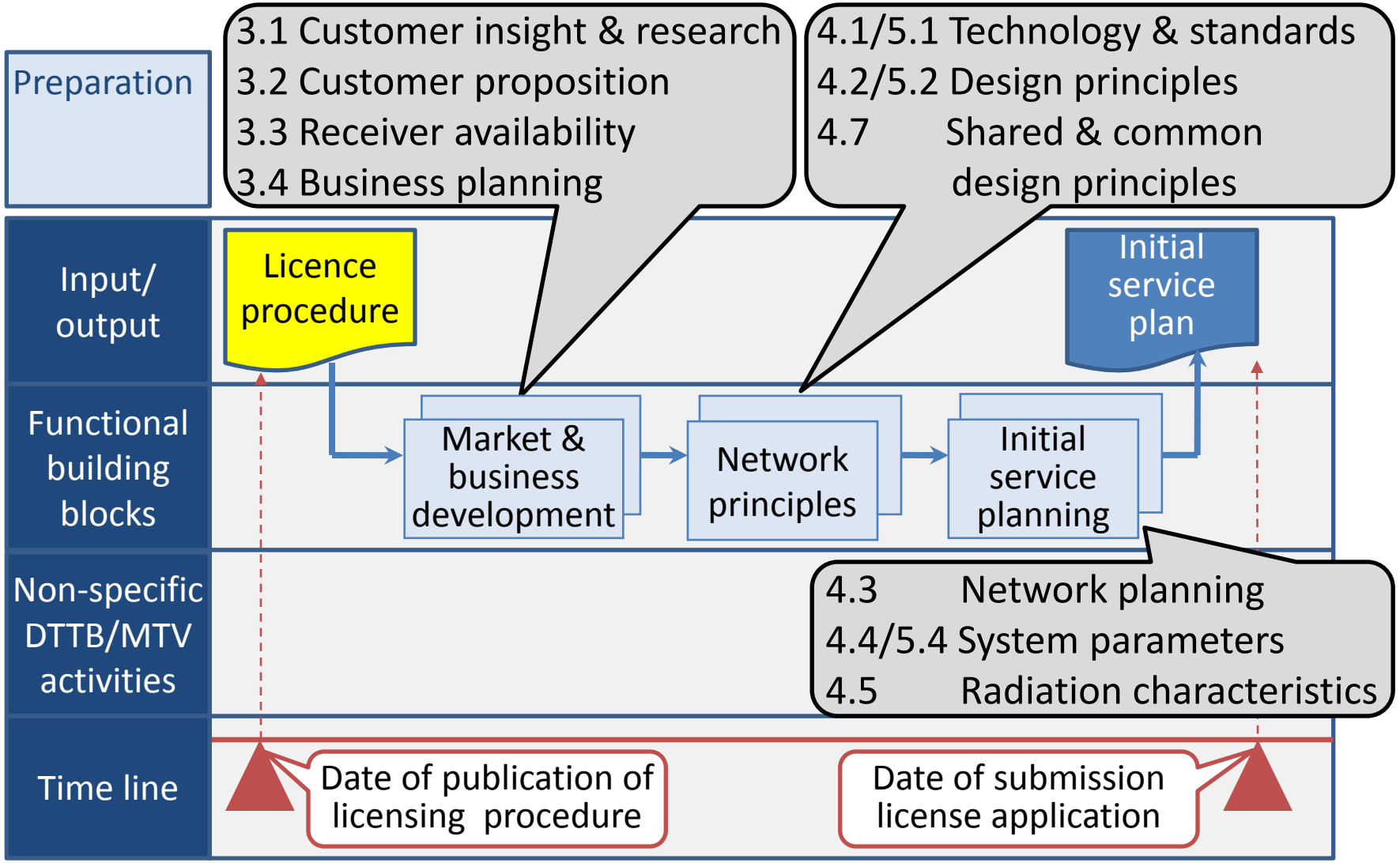
Generic operator's roadmap (1)

- Phases 1, 2 and 3 are carried out sequentially
- Phase 4 is carried out partly in parallel to Phase 3
  - With coordination to ensure compatible results



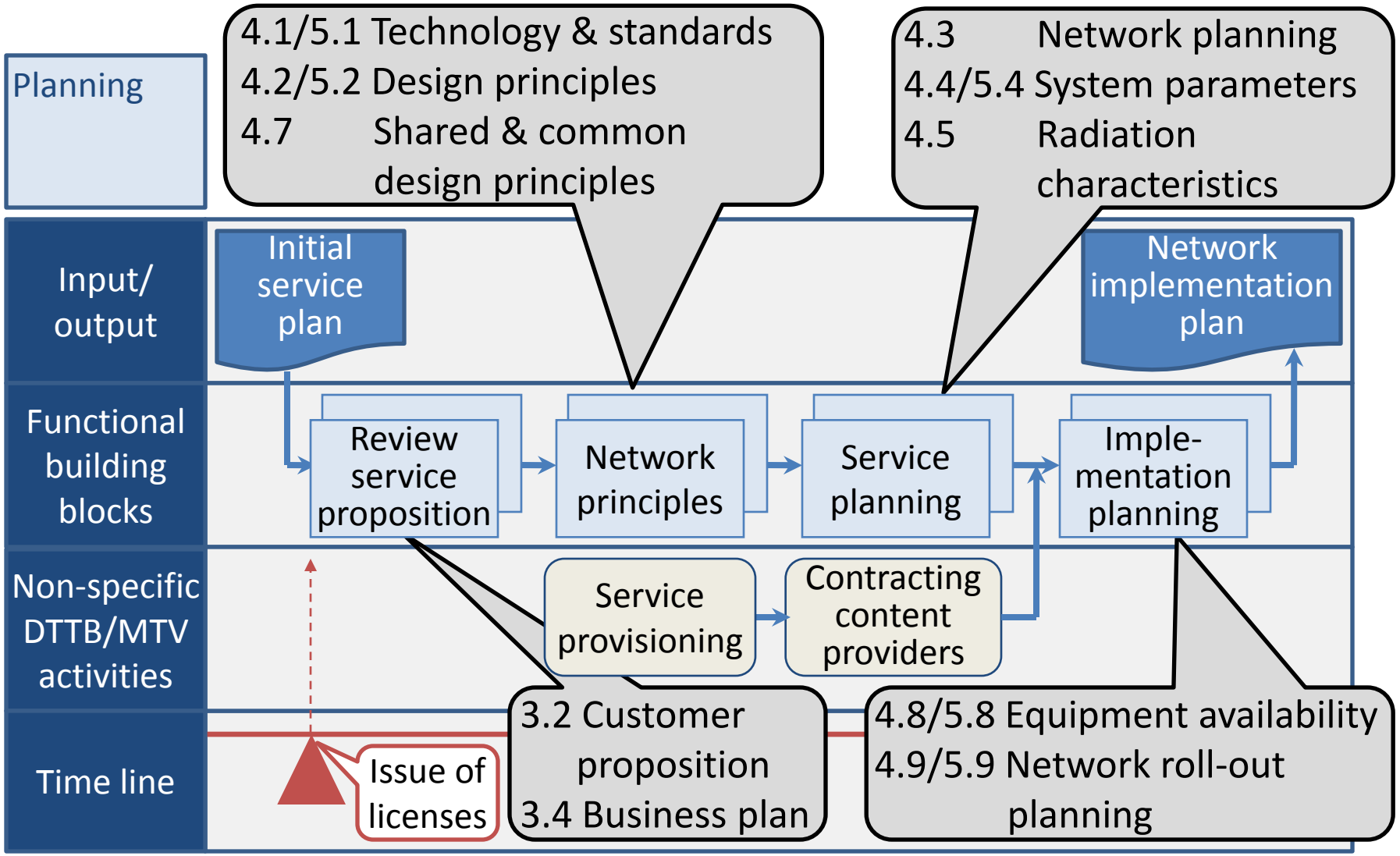
Generic operator's roadmap (2)

Phase 1: Preparation



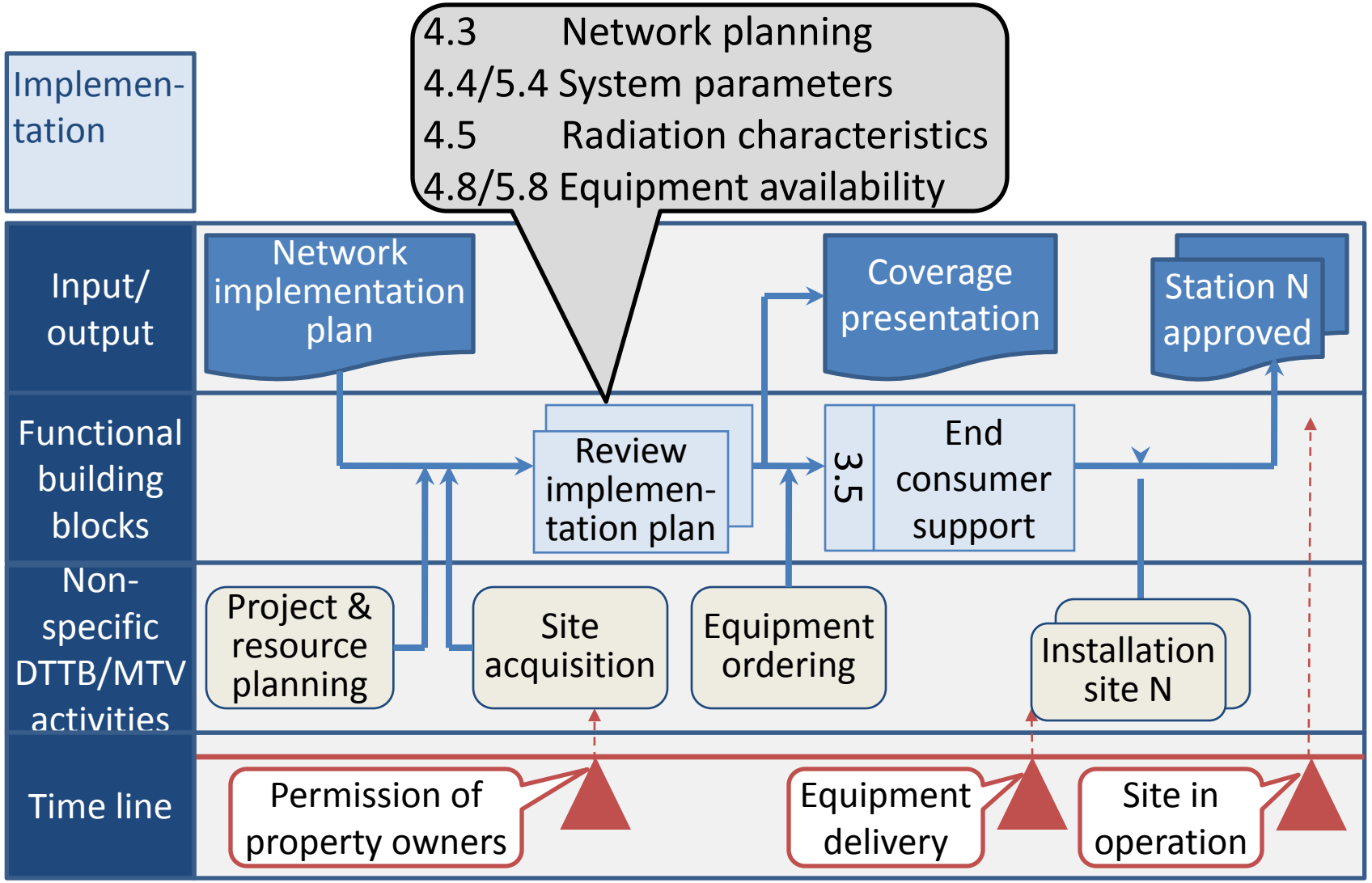
Generic operator's roadmap (3)

Phase 2: Planning



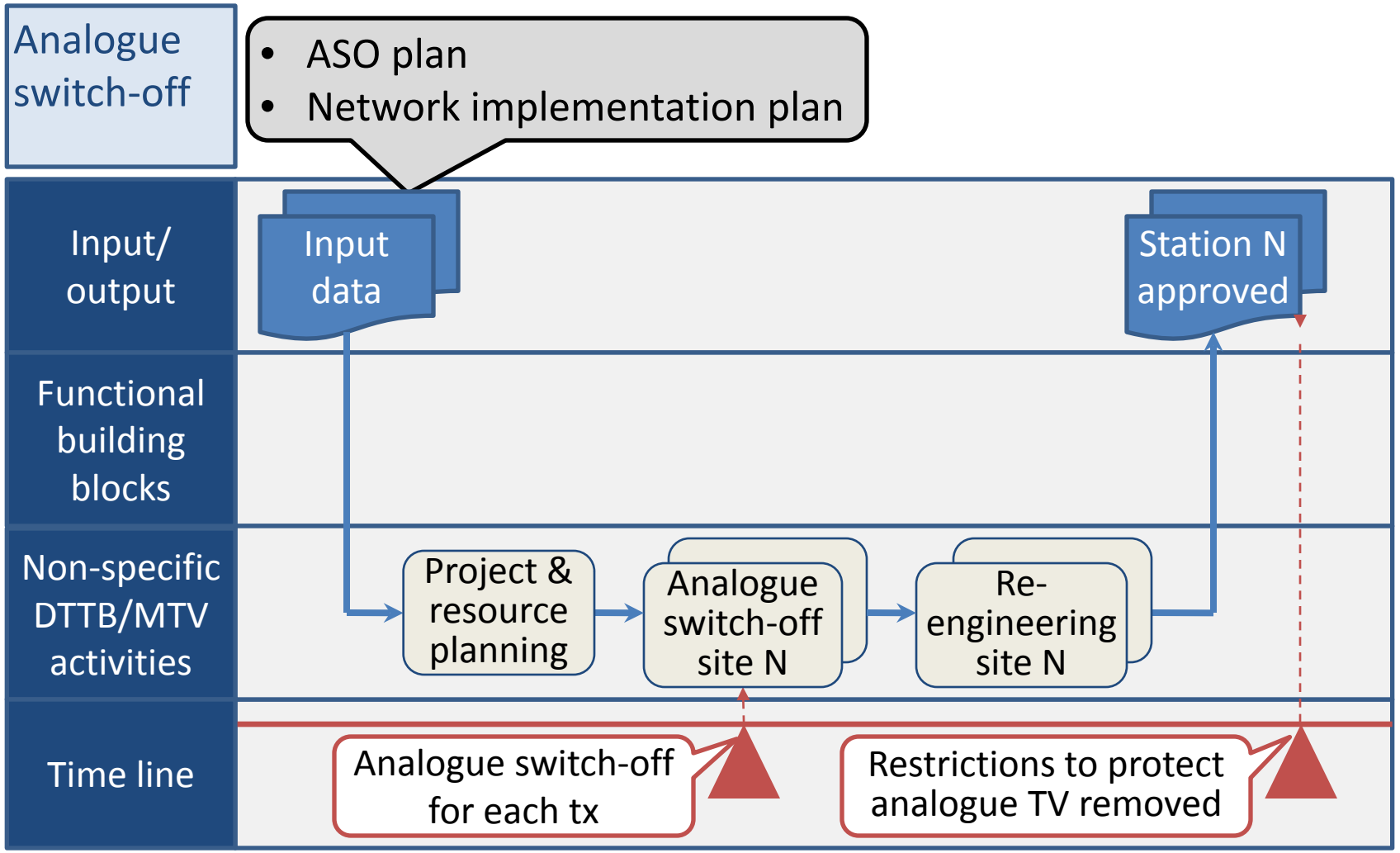
Generic operator's roadmap (4)

Phase 3: Implementation



Generic operator's roadmap (5)

Phase 4: Analogue switch-off



Conclusions regarding roadmap development

Generic roadmaps of whole process of transition to DTTTB and introduction of MTV by Regulator and Operator are given as examples

- National roadmaps may differ, depending on:
  - Market situation
  - Status of implementation
  - Responsibilities and roles of the organization for which the roadmap is made
- It is important to adopt realistic time schedules
  - Implementation of the whole process may take several years and will involve many people

National roadmap development in 7 steps

1. Market analysis
2. Defining DSO objectives
3. Roadmap scoping
4. Defining status of key topics and choices
5. Roadmap construction
6. Defining main activities
7. Selection of top-10 or top-5 main topics

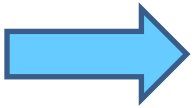
Annex F: Television Broadcasting via Satellite

F.1	Introduction
F.2	Regulations, Procedures
F.3	Satellite Network Design Principles and Roll-out Planning
F.4	Facilities in Broadcasting Station
F.5	Satellite TV Policies and Framework
F.6	Consumer Side, Receivers, Technical Issues
F.7	Equipment Availability
F.8	Cease of Analogue Television Broadcasting via Satellite
F.9	Future Issues
F.10	Conclusions

Introduction

The main focus of the Guidelines is the transition from analogue to DTTB (Digital Terrestrial Television Broadcasting)

The additional information on satellite TV (television broadcasting via satellite)



Insight in the prospects of alternative means of television delivery

Impact on DTTB and ASO (Analogue Switch-Off)

Features of satellite TV delivery

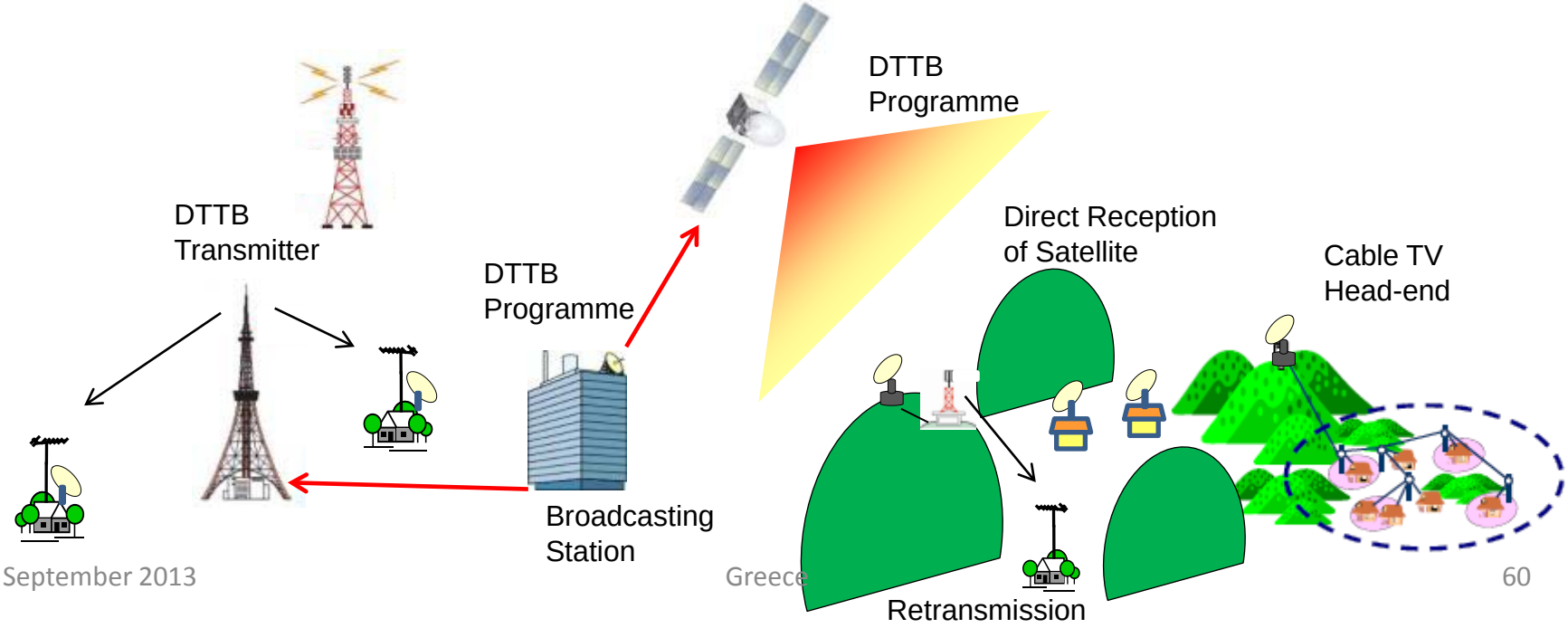
Advantages	Disadvantages
(1) Wide bandwidth	(1) Vulnerable to rain attenuation
(2) Wide coverage area	(2) Difficult to provide local programme
(3) Rapid set-up and ease of reconfiguration	
(4) Low cost	
(5) Initiation of new services	

Role of satellite TV or a satellite

- Providing new services and programmes in addition to the terrestrial broadcasting.
  Competitive or Supplement to DTTB.

- Providing means to achieve a 100% coverage of the intended DTTB service area. The last 10 % coverage costs more than the first 90%.

- Feeding the TV programmes directly from a satellite to DTTB transmitter sites or cable TV head-ends.



Facilities in Broadcasting Station

- **Services that may require specific facilities**

(1) HDTV and SDTV simultaneous transmission

(2) 5.1 channel surround sound

(3) EPG (Electronic Program Guide)

(4) Data Broadcasting (Ancillary service)

(5) EWBS (Emergency Warning Broadcasting System)

(6) Receiver upgrade by software (SSU : System Software Upgrades)

(7) Hierarchical transmission (graceful degradation) in order to avoid service disruption on the occasion of large rain attenuation

(8) CAS (Conditional Access System)

(9) Site Diversity for Feeder-Link, Backup Station

Conclusions

- The migration from analogue to digital technology on the satellite TV, similar to the terrestrial TV, provides opportunities for increasing TV qualities and new services.
- The efficient use of spectrum by digital broadcasting can make frequencies available for new entrants and services.
- It can also provide a means of distribution of terrestrial programmes to its transmitter sites, or play a role of compensation for DTTB in the poor reception area.
- For the future issues, the satellite TV continues evolving technical innovations and satisfying the viewer's needs.

Annex G - Television delivery via cable TV networks and IPTV

G.1	Introduction
G.2	IPTV domains
G.3	Cable TV
G.4	IPTV and cable TV services
G.5	Quality of Experience (QoE) and Quality of Service (QoS)

Introduction

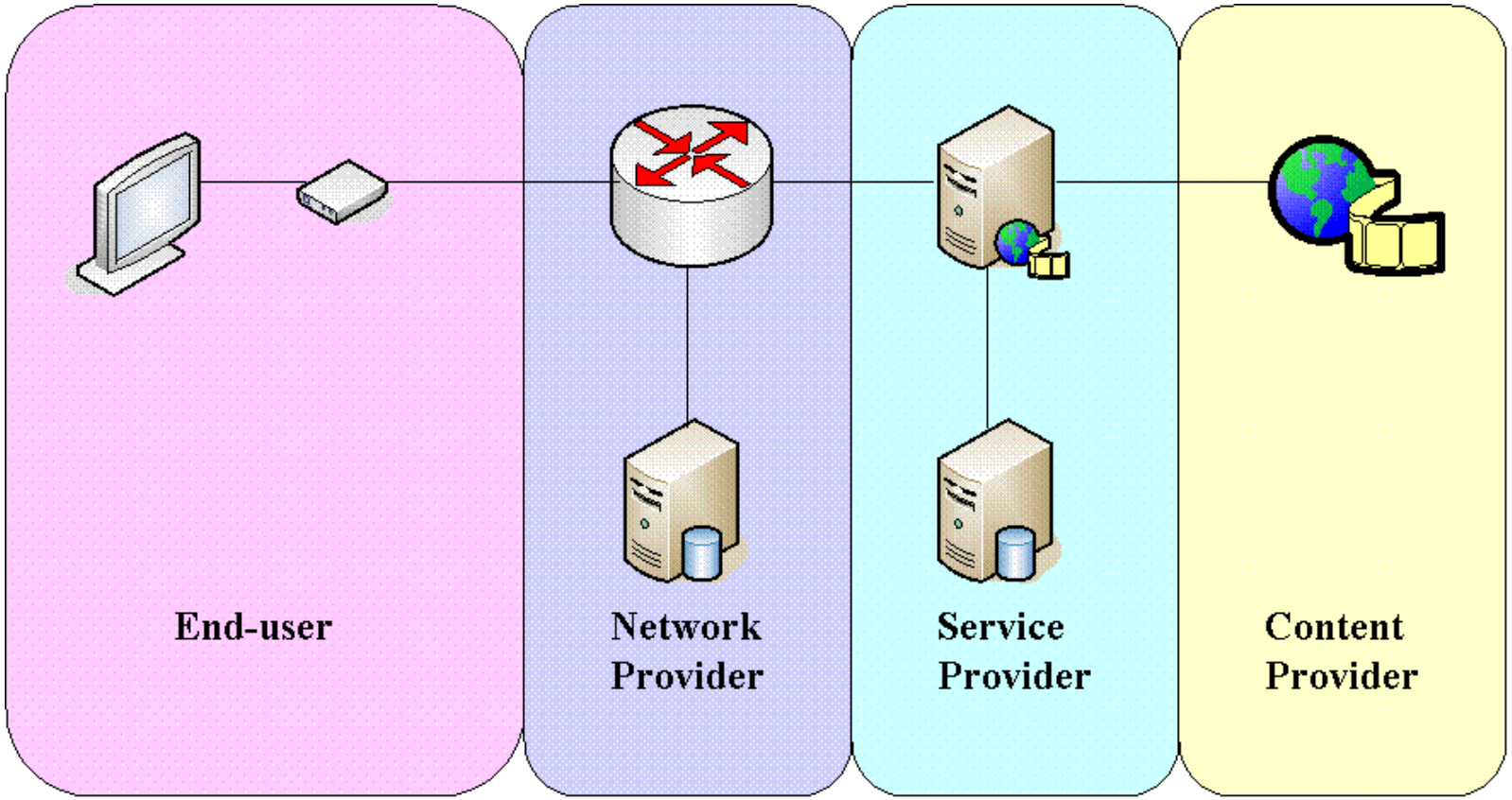
IPTV service over IP networks

Cable TV service over cable networks

- These are complementary or competing means to deliver broadcast programmes.

IPTV domains

- Four main domains of IPTV

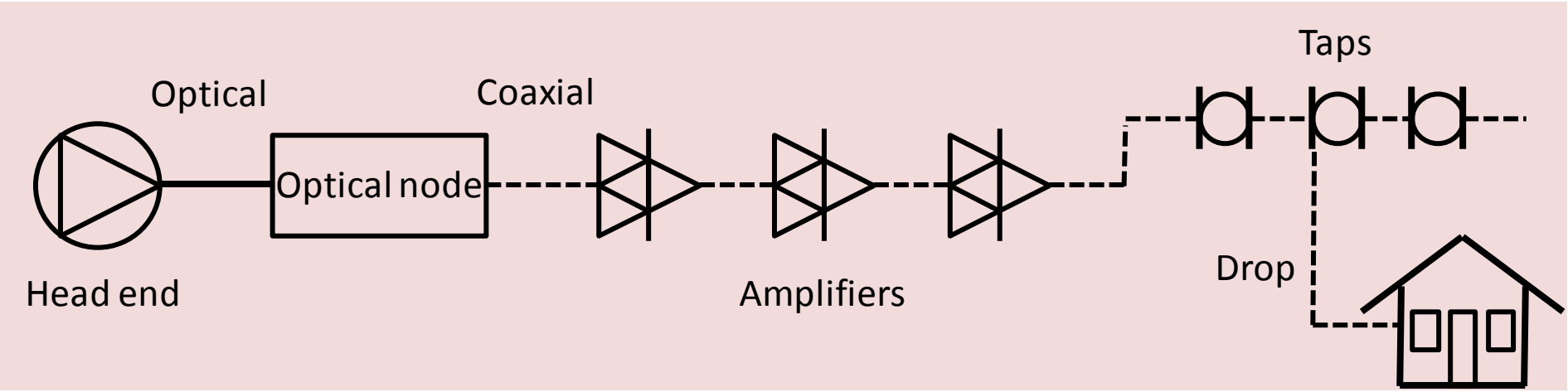


- Rec. ITU-T J.700 “IPTV service requirements and framework for secondary distribution”

Cable TV

- Cable TV distributes television programs to subscribers via radio frequency (RF) signals transmitted through coaxial cables or fibre-optic cables.

Hybrid Fibre Coaxial (HFC) System




RELEVANT ITU ACTIVITIES

Regional initiatives

- In all regions Digital broadcasting and transition
  - Africa
  - Asia Pacific
  - Arab
  - Americas
  - Europe (Central and Eastern Europe)
  - CIS

Major events during the last period / 1

- **ITU Telecom 2011, Geneva**
  - Ministerial Roundtable, 26 October : The Transition to Digital Television and the Digital Dividend
    http://world2011.itu.int/digital-television
- **The Fifth World Electronic Media Forum**
  - Accra, Ghana, 16-18 November 2011
    http://www.aub-uar.org/wemf/
  - Session 1, Migration to Digital Radio and Television
  - Accra Declaration:
    http://www.ebu.ch/CMSimages/en/DW_%20THE%20ACCRA%20DECLARATION%20final%20_2__tcm6-73225.pdf
- **Digital Migration and Spectrum Policy Summit (ITU-ATU)**
  - Nairobi, Kenya, 29 November – 1 December 2011
    http://atu-uat.org/index.php/en/reports/digital-migration-reports
  - Recommendations
    http://atu-uat.org/images/eventlist/events/files/reportsfolder/Digital%20Migration%20&%20Spectrum%20Policy%20Summit_Recommendations.pdf?r=0.9003948695026338

Major events during the last period / 2

- **WRC-12**
  - 23 January – 17 February 2012, Geneva
    http://www.itu.int/ITU-R/index.asp?category=conferences&rlink=wrc-12&lang=en
  - Agenda item 1.17
    consider results of sharing studies between the mobile service and other services in the band 790-862 MHz in Regions 1 and 3, in accordance with Resolution **749 (WRC-07), to ensure the adequate protection of services to which** this frequency band is allocated, and take appropriate action
- **Workshop on Transition to Digital Terrestrial Television Broadcasting**
  - 27 February – 2 March 2012, Bangkok, Thailand
    http://academy.itu.int/moodle/course/view.php?id=353
- **Connect Arab Summit**
  - 5 – 7 March 2012, Doha Qatar
    http://www.itu.int/ITU-D/connect/arabstates/

Major events during the last period / 3

- **Connect Americas Summit**
  - 17-19 July 2012, Panama City (Panama)
    http://www.itu.int/ITU-D/connect/americas/
- **13th Forum on Telecommunication/ICT Regulation and Partnership in Africa (FTRA-2012)**
  - 18 to 20 June 2012, Libreville (Gabon)
    http://www.itu.int/ITU-D/afr/events/FTRA/2012/index.html
- **ITU Workshop for the CIS Countries "Trend in the Development of Radiocommunication as a Result of WRC-12. Technical and Regulatory Aspects",**
  - 5-8 June 2012, St. Petersburg (Russian Federation),
- **Sub-Regional Workshop on Digital Television Migration and Digital Dividend**
  - 30 May-1 June 2012, Montevideo (Uruguay),
- **ITU-AIBD-ABU Regional Workshop on "Digital Broadcasting: Opportunities, Business and Challenges"**
  - 26-28 May 2012, Bangkok (Thailand)
    http://www.itu.int/ITU-D/tech/events/index.html

Major events during the last period / 4

- **2nd ATU/ITU Digital Migration and Spectrum Policy Summit**
  - Accra (Ghana) 27-28 September 2012
  - http://atu-uat.org/index.php/en/reports/digital-migration-reports
- **Global ICT Forum on Human Capacity Development**
  - Cape Town (South-Africa), 2-25 October 2012
  - http://academy.itu.int/moodle/course/view.php?id=551
- **ITU Regional Seminar for Europe on Transition to Digital Broadcasting and Digital Dividend**
  - Budapest (Hungary), 5-7 November 2012
  - http://www.itu.int/ITU-D/eur/ri/broadcasting/seminar/index.html
- **ITU-ABU-AIBD Regional Workshop on Digital Broadcasting Implementation**
  - Kuala Lumpur, (Malaysia), 4-5 March 2013
- **ITU ITU/CTU/CBU Workshop on Spectrum Management and Digital Television Transition**
  - St. Vincent and the Grenadines, 29th April -3 May 2013

Assistance provided by BDT for Asia-Pacific

- Revision of Guideline incorporated Asia Pacific information
- KCC phase 1, Five countries :
  - Cambodia, Mongolia, Nepal, Sri Lanka, Tonga
- KCC phase 2: Seven countries:
  - Fiji, Indonesia, Myanmar, PNG, Philippines, Thailand, Laos and Timor Leste (in process)
- KCC phase 3: Three countries
  - Bangladesh, Vietnam
  - Guyana (Caribbean)
- Additional assistance:
  - Bhutan, Maldives
  - Co-organizing workshops, seminars with ABU and AIBD
- Strengthening cooperation agreement among ITU-ABU-AIBD

Documents, reports

- **Guideline for the Transitions**
  - Available in French
  - Update with Asia-Pacific information, including archives:
    - http://www.itu.int/ITU-D/tech/digital_broadcasting/project-dbasiapacific/Digital-Migration-Guidelines_EV7.pdf

- **Roadmaps for ASP and AFR**
  - http://www.itu.int/ITU-D/tech/digital_broadcasting/project-dbafrica/db_afr_roadmaps.html
  - http://www.itu.int/ITU-D/tech/digital_broadcasting/project-dbasiapacific/db_asp_roadmaps.html

- **Digital Dividend: Insights for spectrum decisions**
  - http://www.itu.int/ITU-D/tech/digital_broadcasting/Reports/DigitalDividend.pdf

- **Digital broadcasting trends**
  - http://www.itu.int/en/ITU-D/Technology/Documents/Broadcasting/TrendsinBroadcasting.pdf

- **Spectrum Management Training Program (SMTP)**
  - http://academy.itu.int/index.php/news/item/1077-smcp

- **WRC-12 Final Acts**
  - http://www.itu.int/pub/R-REG-RR/en

Conclusions

Transition to DTTB and the introduction of MTV services is a complex process

- Involving decisions on key topics and choices of 41 functional building blocks
- In a practical situation, a number of decisions may have already been taken.
  - Some decisions may need to be reviewed when applying the Guidelines.

Experience has shown a number of essential conditions for a successful transition to DTTB and introduction of MTV services

- Strong leadership of government
- Firm decision of analogue TV switch-off date
- Close cooperation of Regulator and market parties
- Clear and timely regulatory framework (including decisions on the “Digital Dividend”)
- Adequate information and assistance to viewers

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