



Handbook ●●●

for developing a Converged Licensing Framework

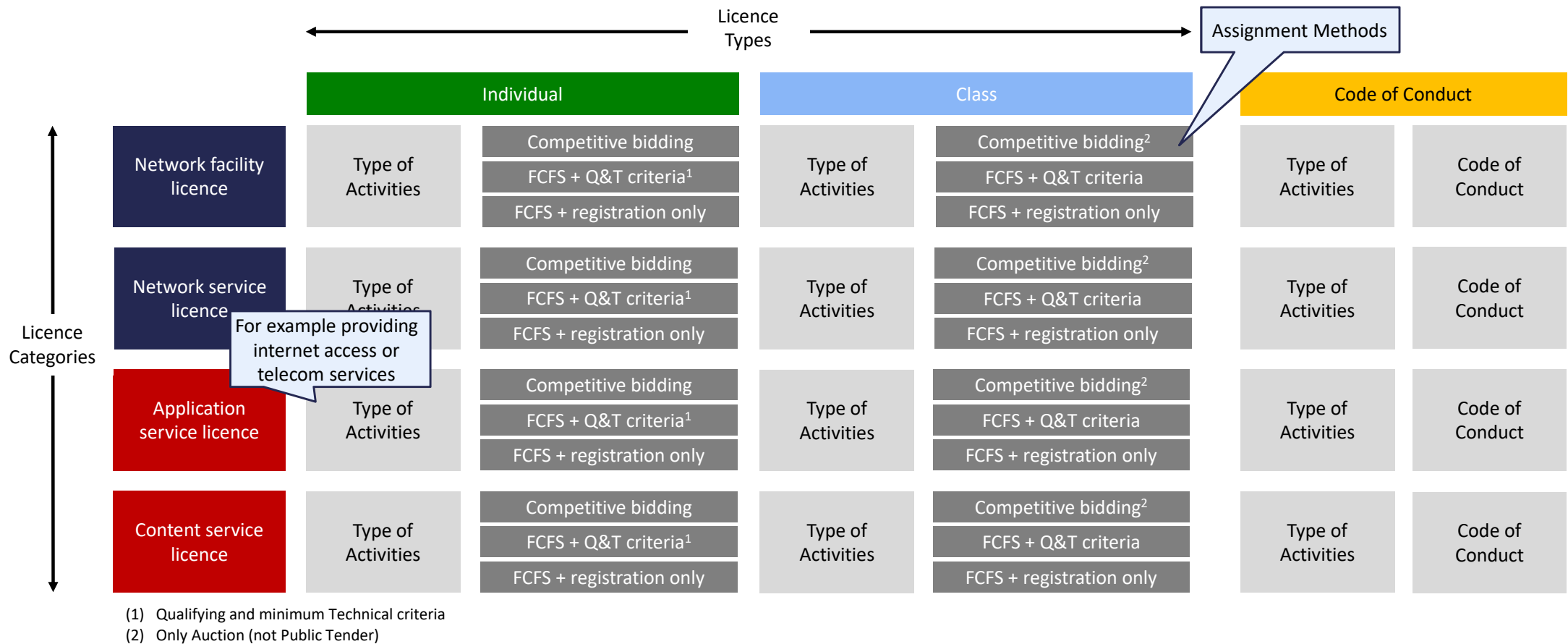
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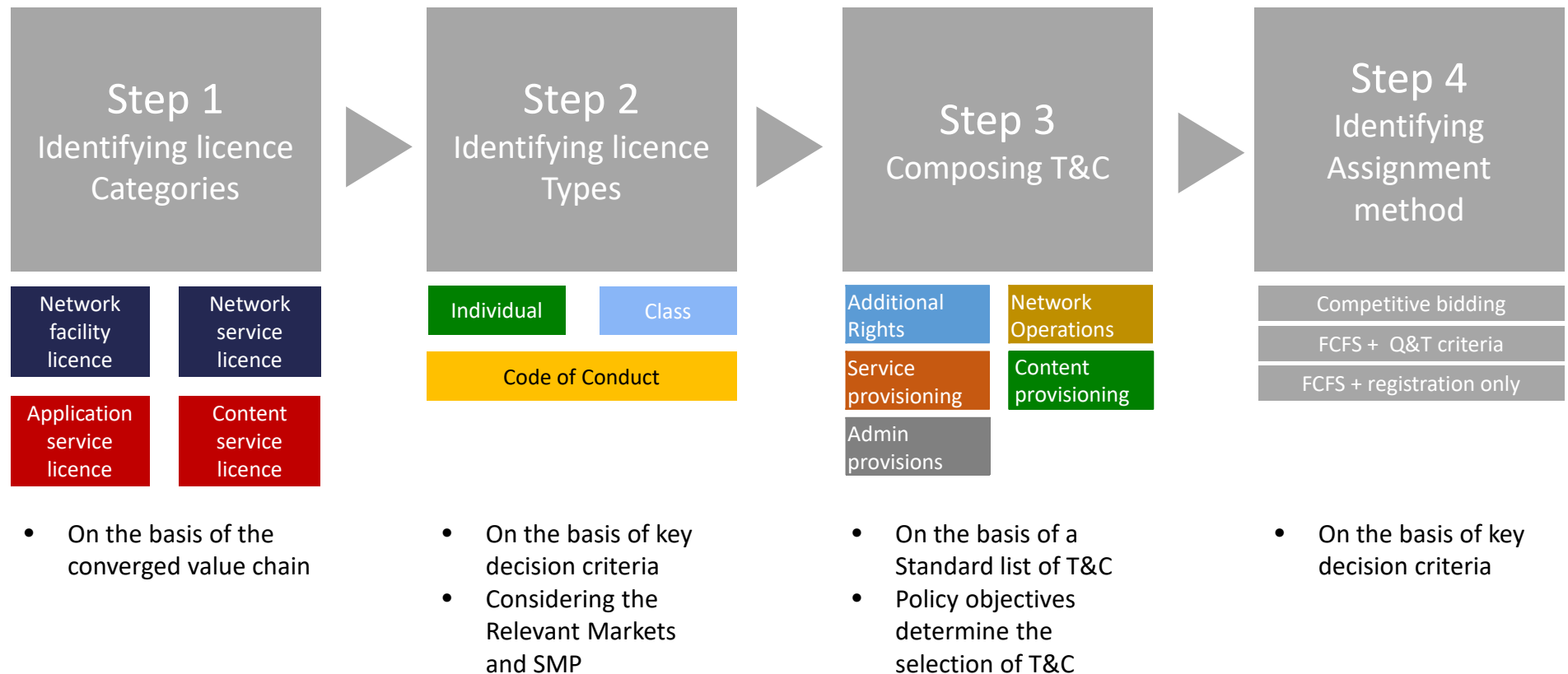


The CLF model

The CLF model – Four tier model



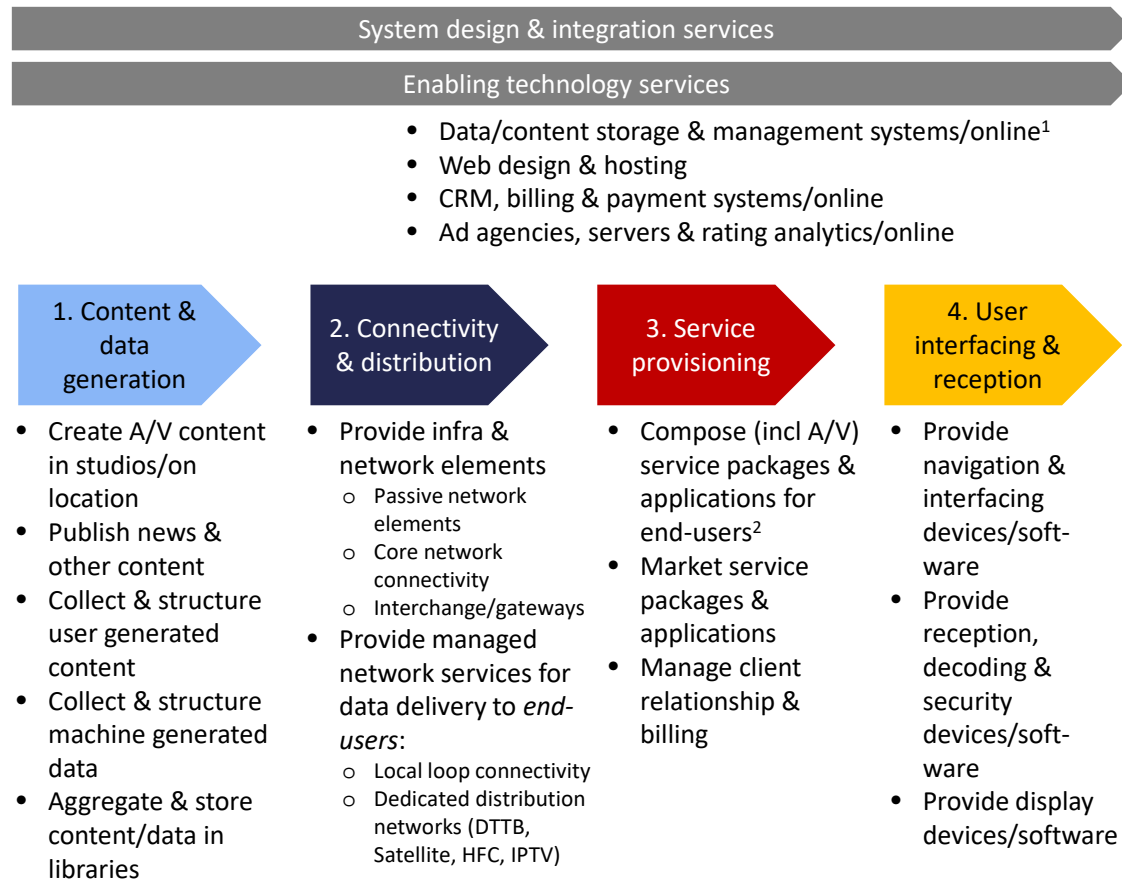
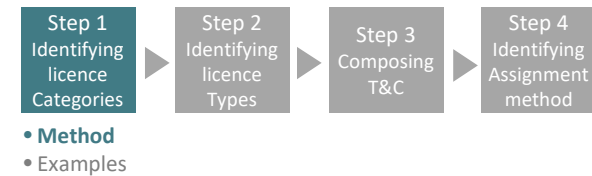
The CLF model – Four steps to fill the model





Step 1: Identifying Licence Categories

Step 1 - The ICT converged value chain

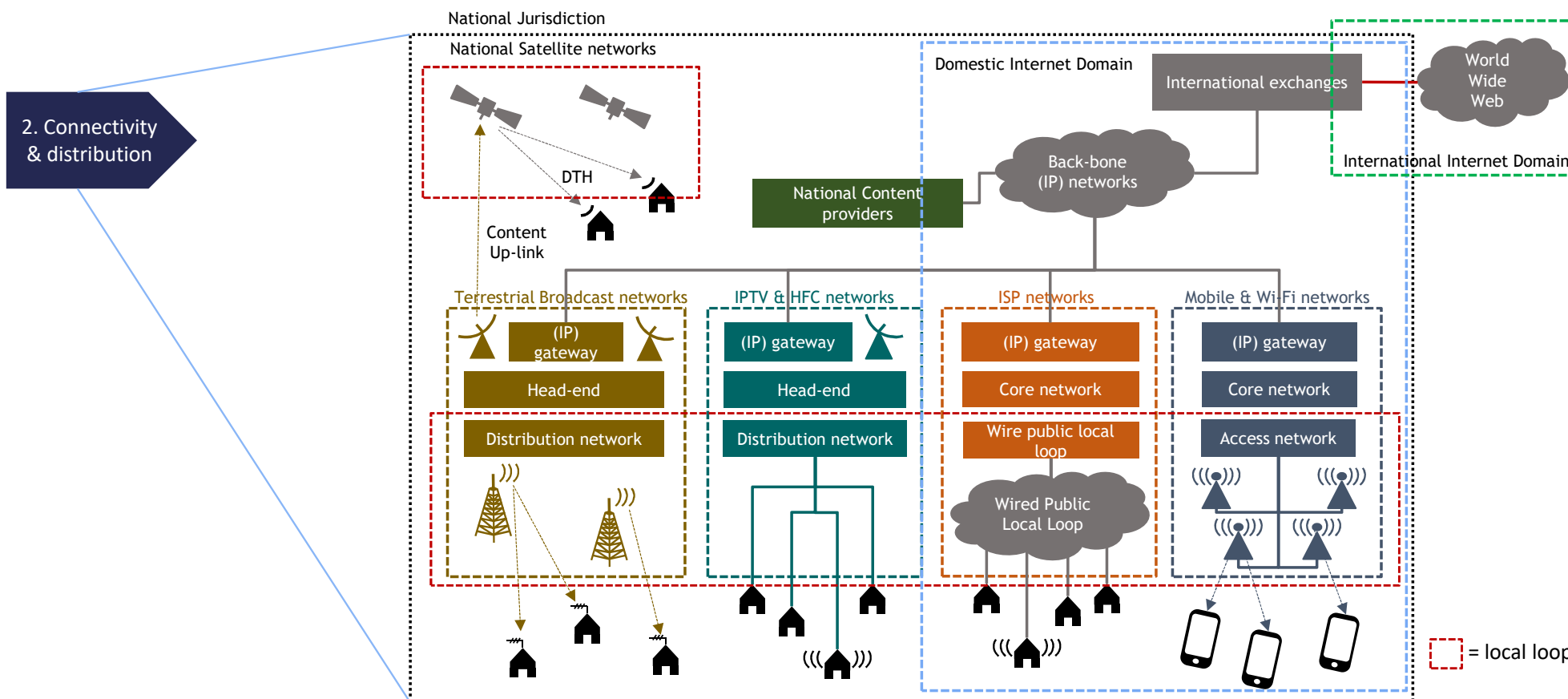


- (1) Includes activities like CDNs, Cloud applications & services
- (2) For non-content services, the services are delivered by the NO configuring the network (elements), on instructions of the SP
- (3) IoT users are manufacturers that produce M2M communication devices (such as connected cars or smart meters)

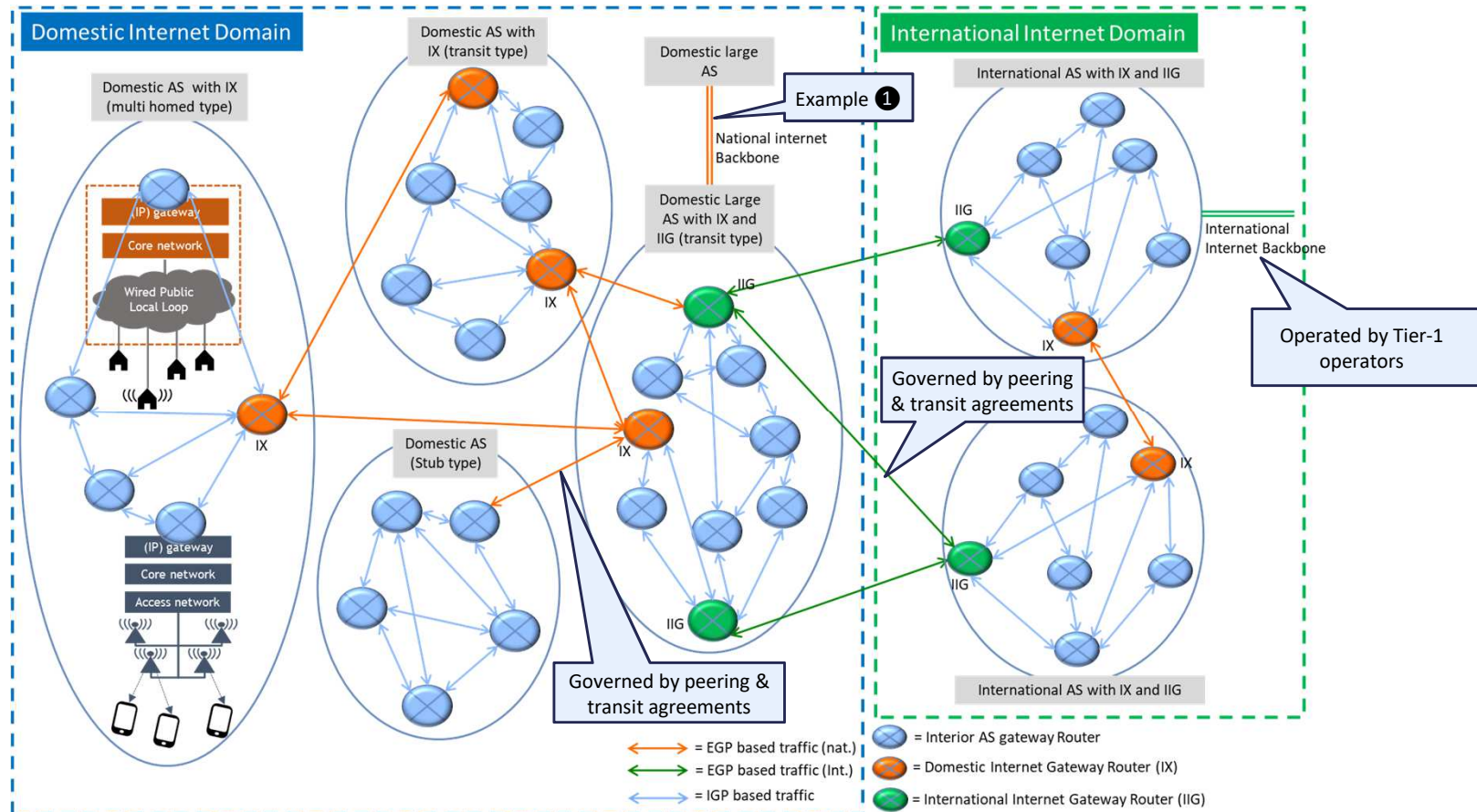
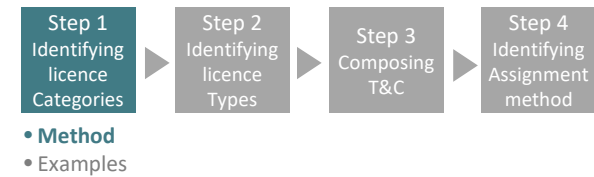
Step 1 – Mapping on network architectures



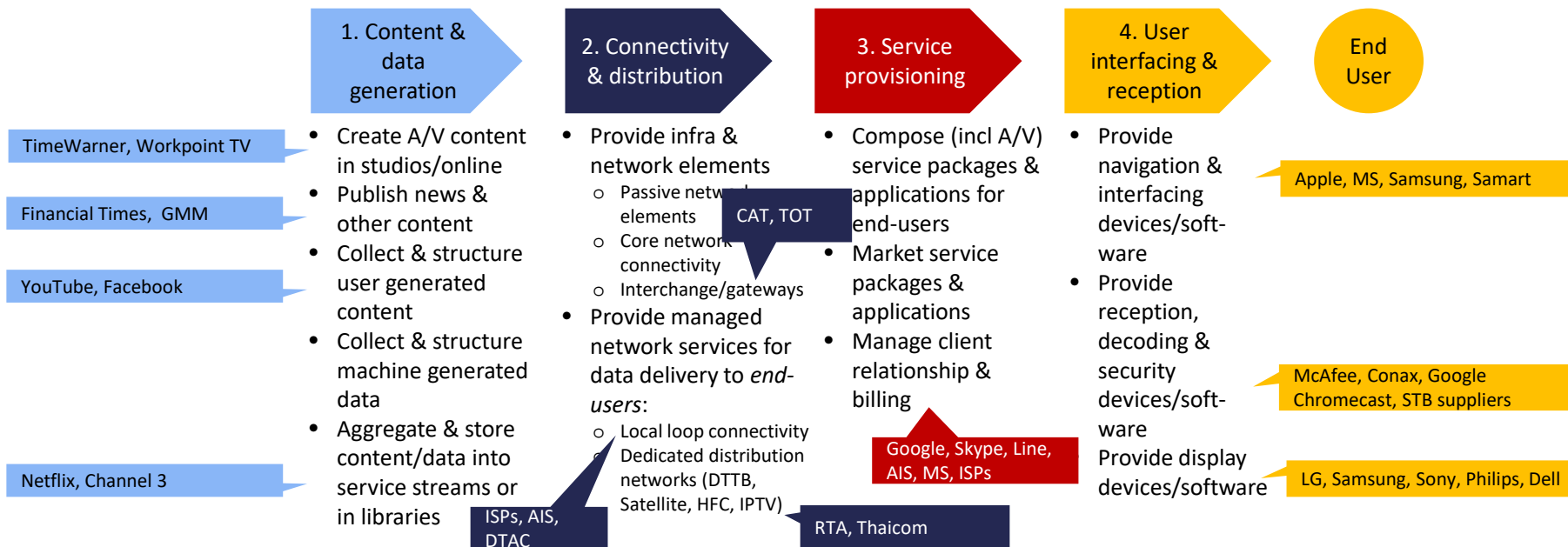
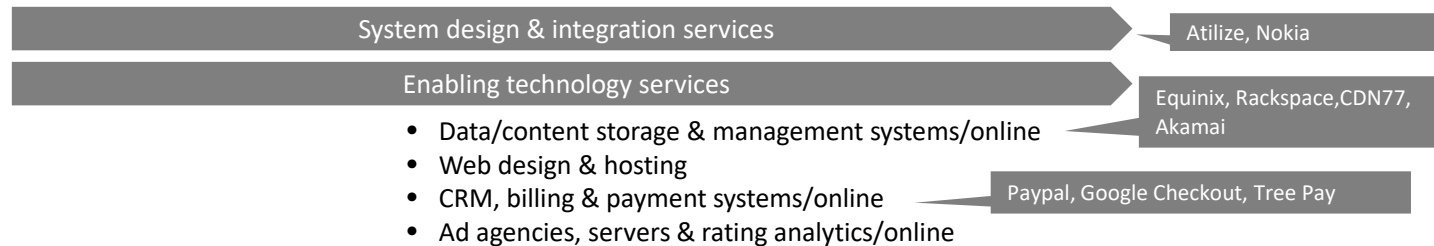
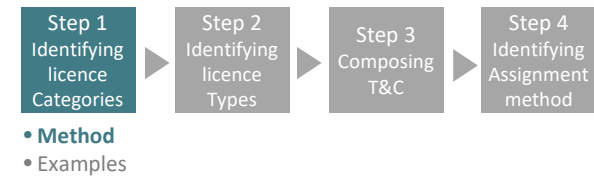
- Method
- Examples



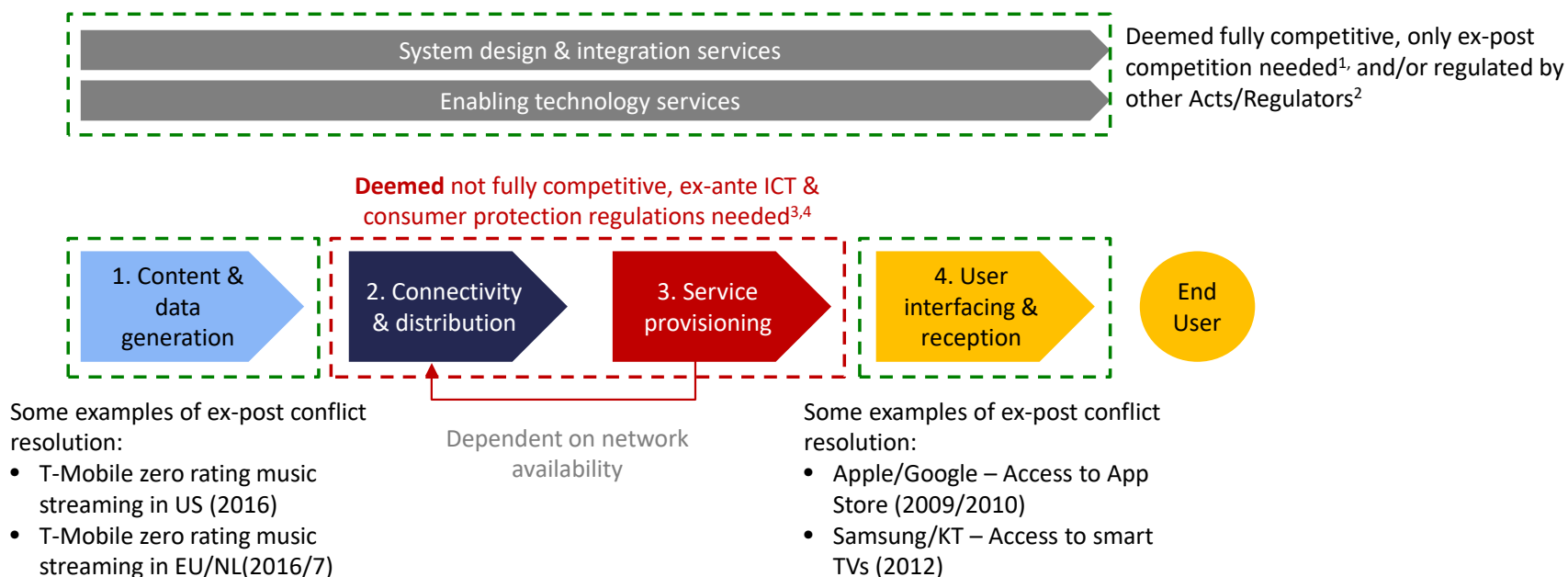
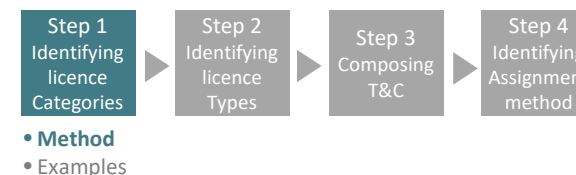
Step 1 – IP architecture



Step 1 - Examples of companies in the value chain

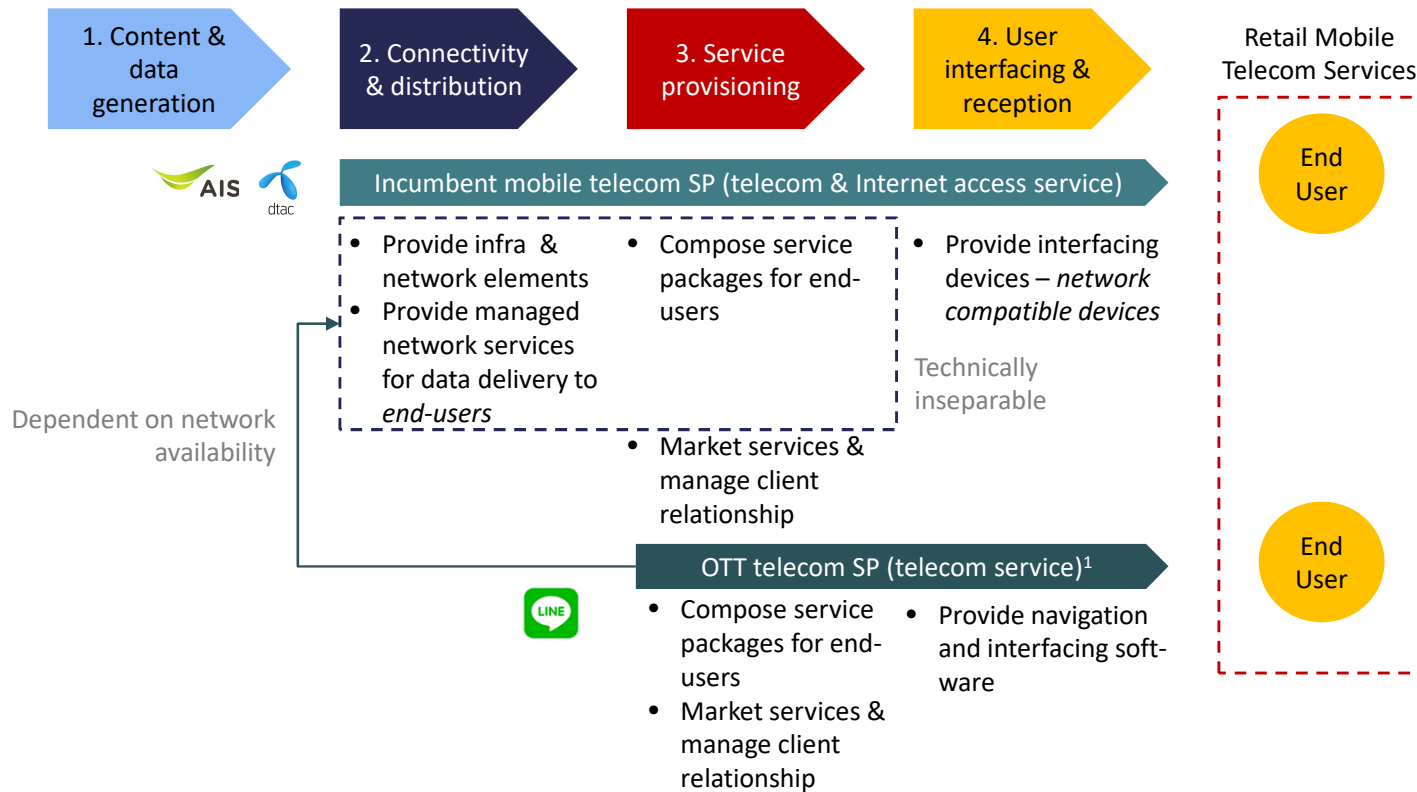
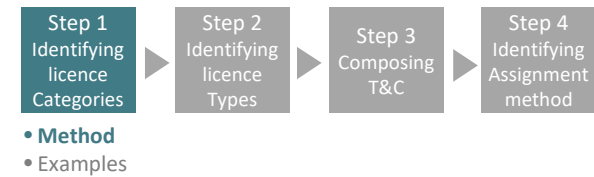


Step 1 - Scope of ICT Regulations



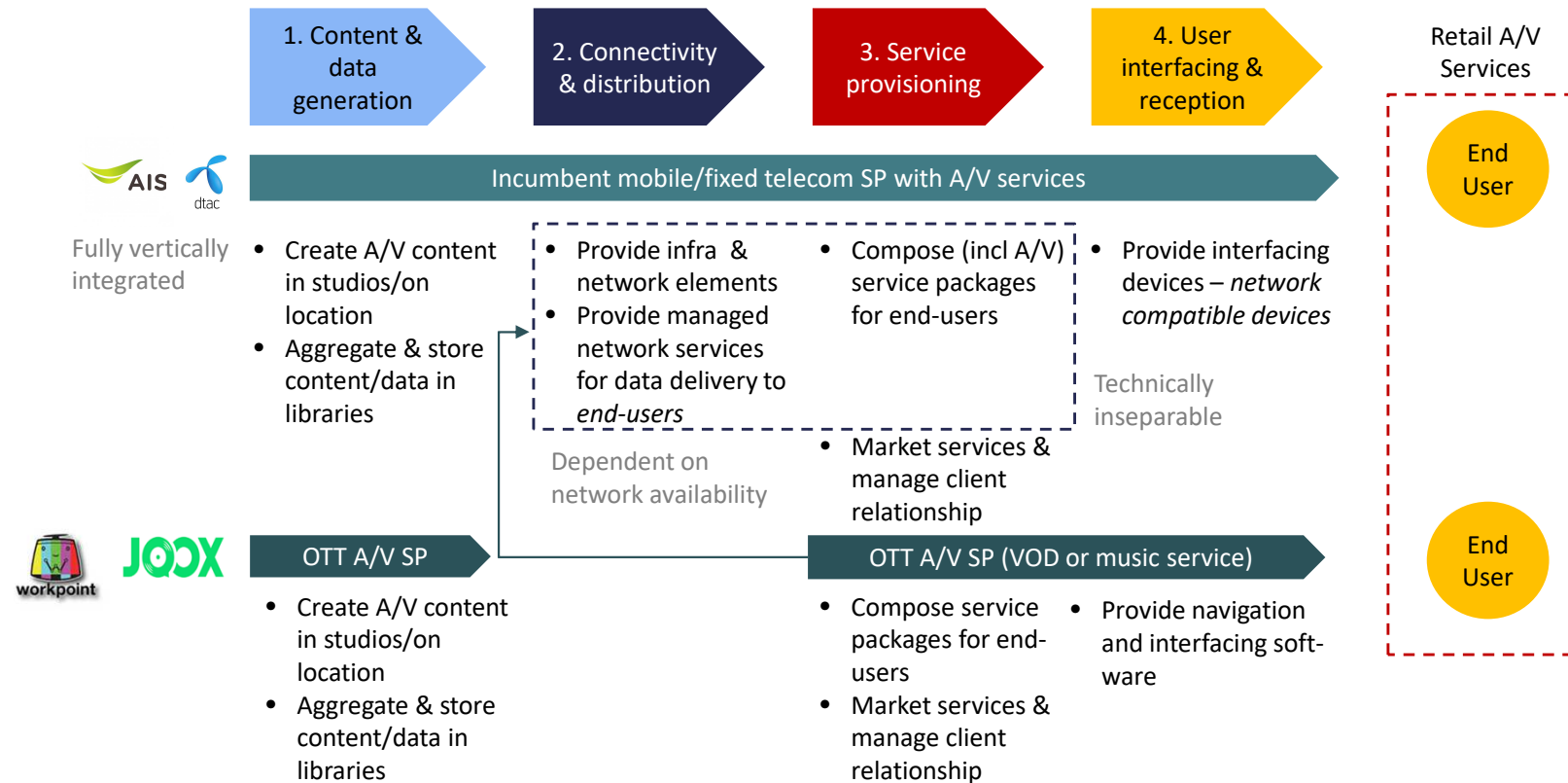
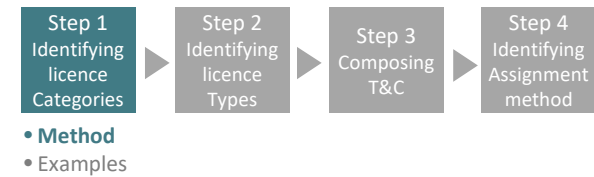
- (1) Characterized by a market without Significant Market Power (SMP) providers
- (2) For example, Banking Acts/Central Bank & Financial Service Authorities or Consumer protection Acts/Ombudsmen & Trade Commissions
- (3) Competition and ICT regulations often needs to work closely together
- (4) ICT regulatory scope includes Type Approval (which may entail a separate licence in the case of importing equipment)

Step 1 – The same relevant market (retail)



(1) The same as MVNOs, who are dependent on network availability

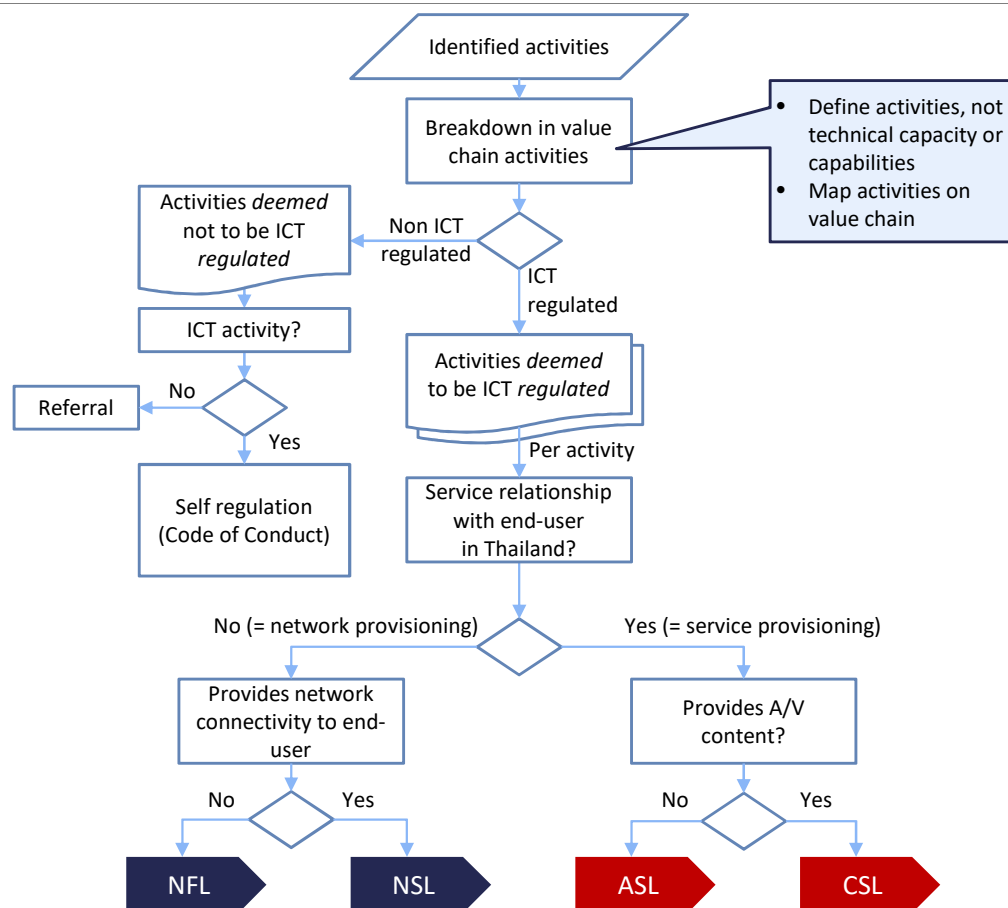
Step 1 – The same relevant market (retail)



Step 1 – Overview



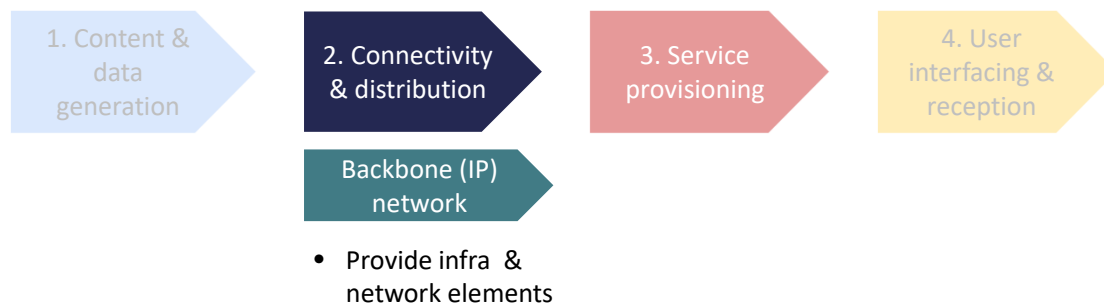
- **Method**
- Examples



Step 1 – Example 1 Backbone network



- Method
- Examples

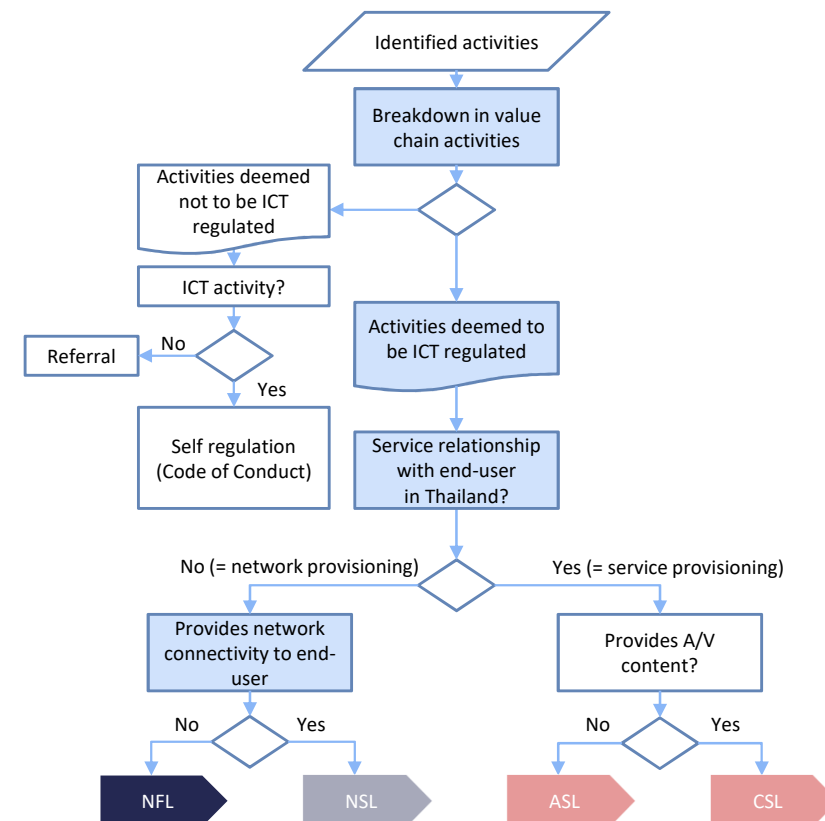
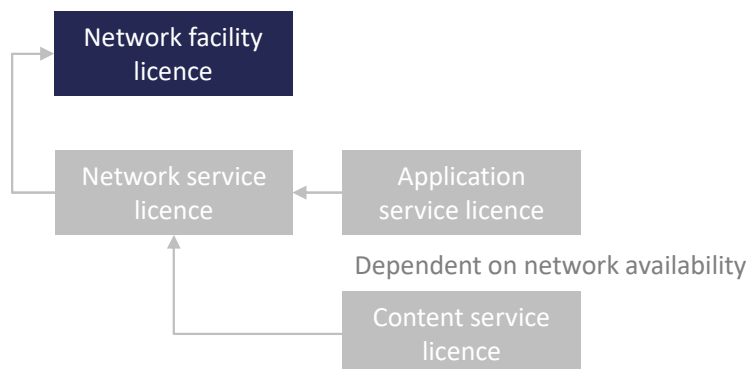


For example as provided by:

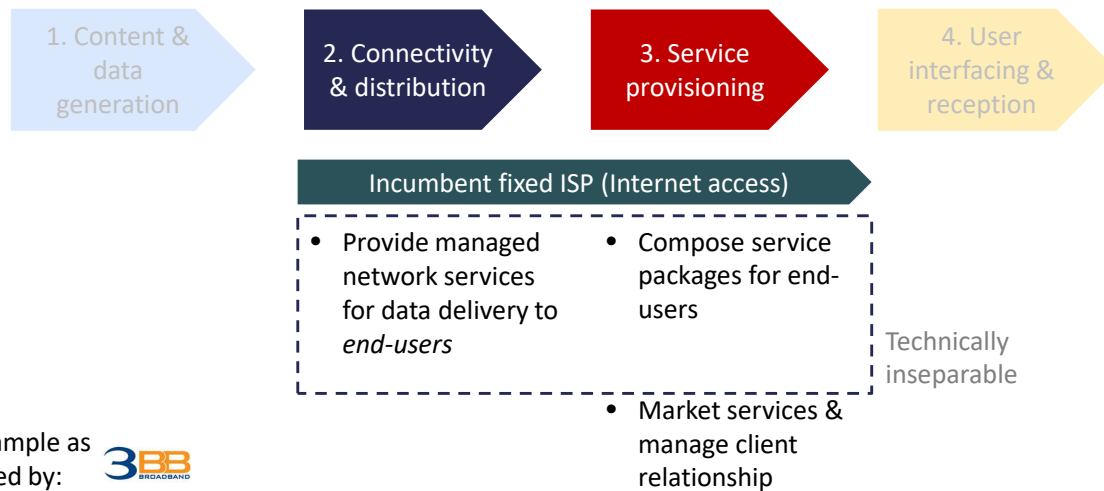
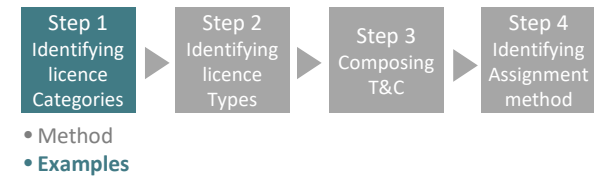


Licence Categories

Dependent on availability network elements



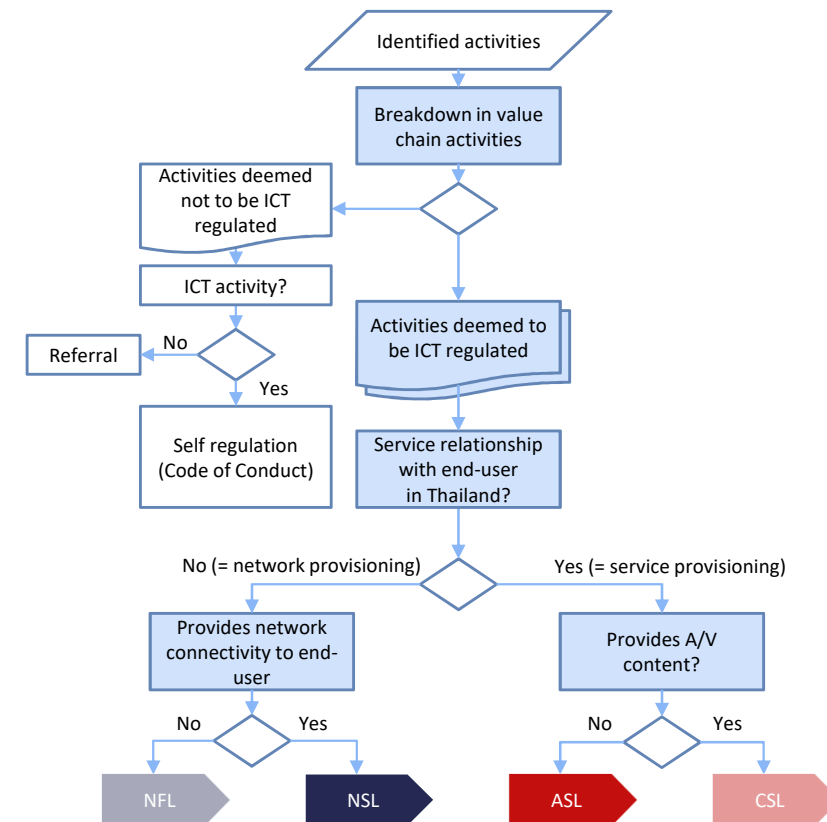
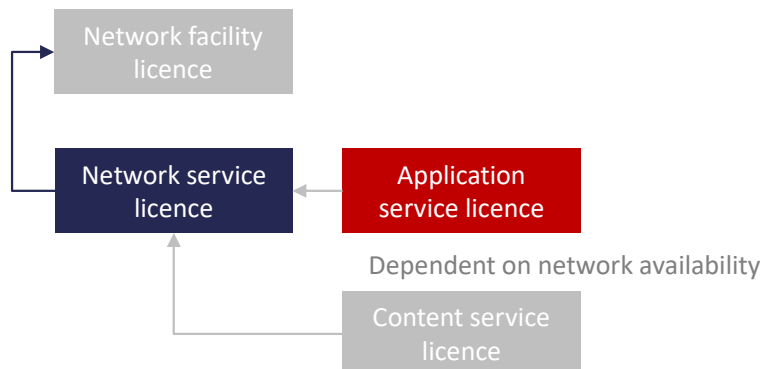
Step 1 – Example 2 Fixed ISP



For example as provided by: **3BB** BROADBAND

Licence Categories

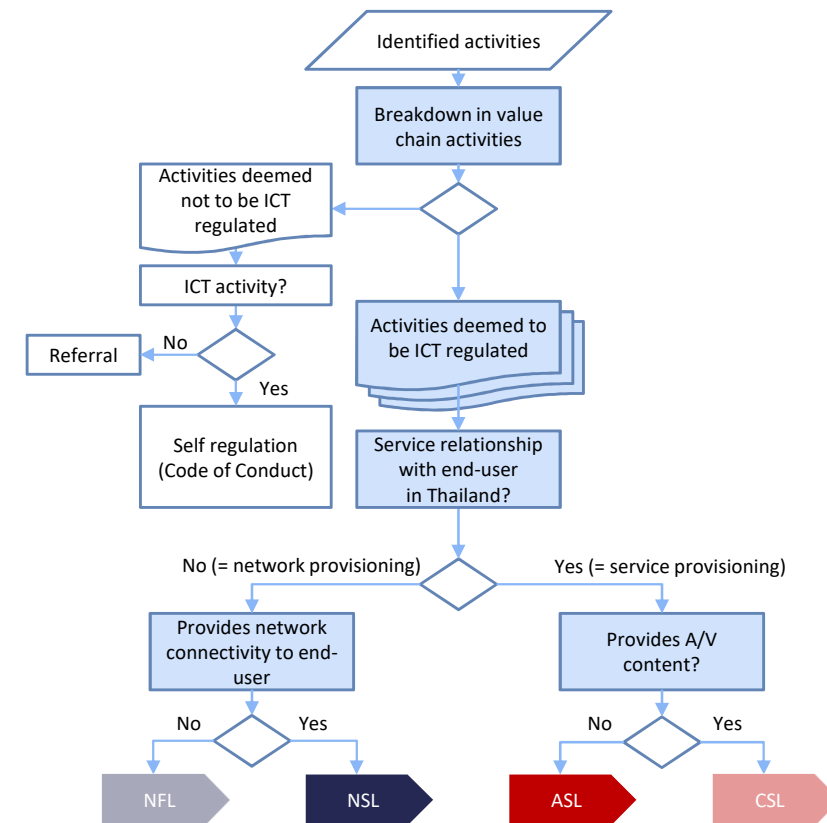
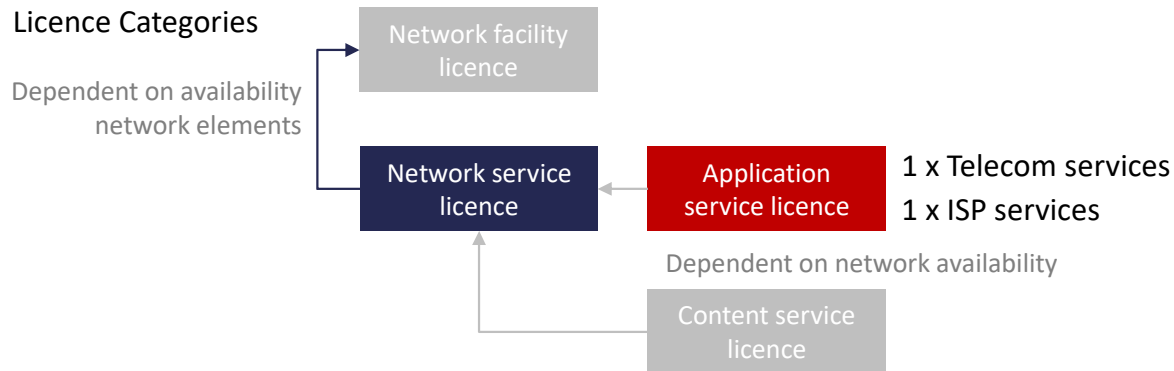
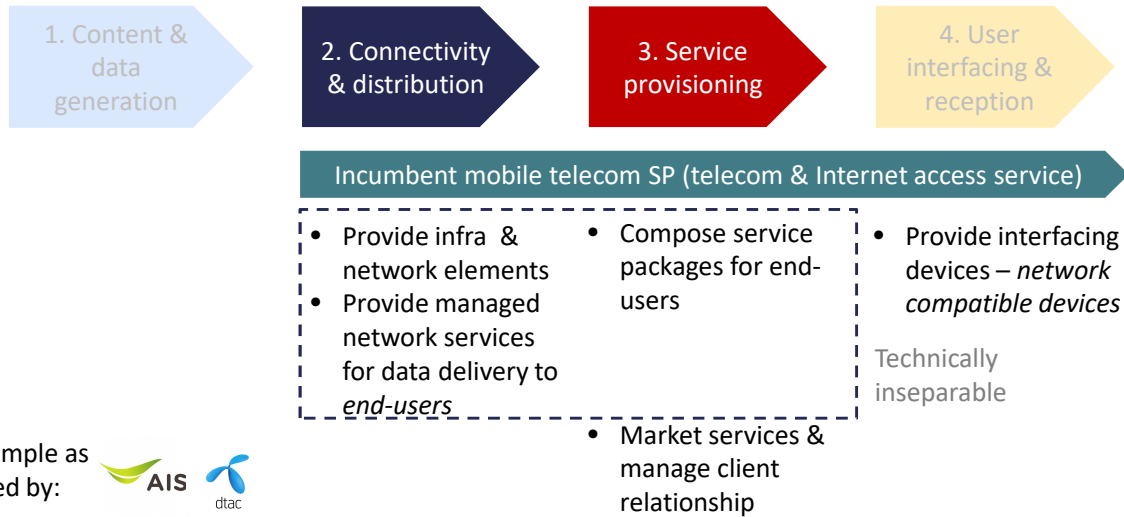
Dependent on availability network elements



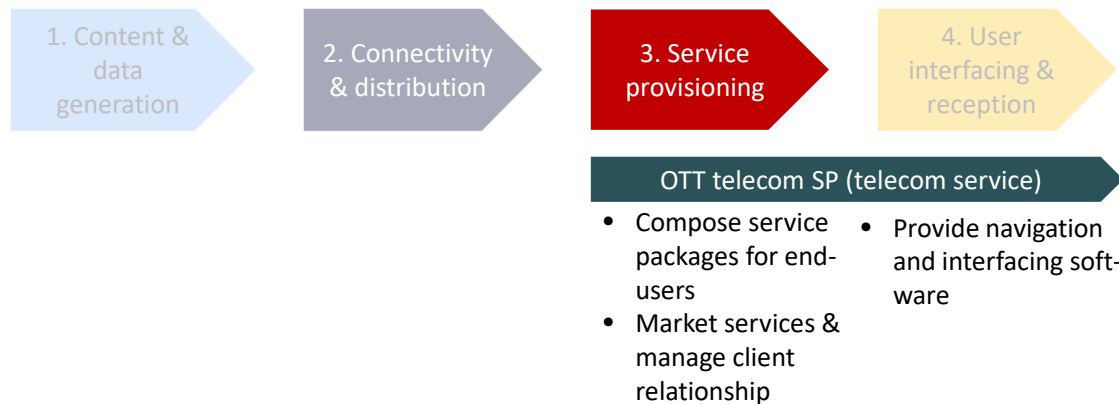
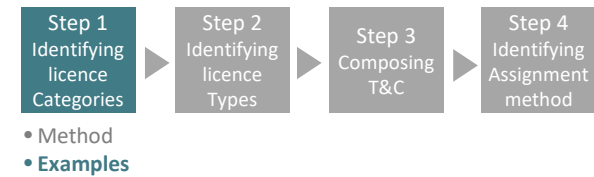
Step 1 – Example 3 Mobile telecom & internet



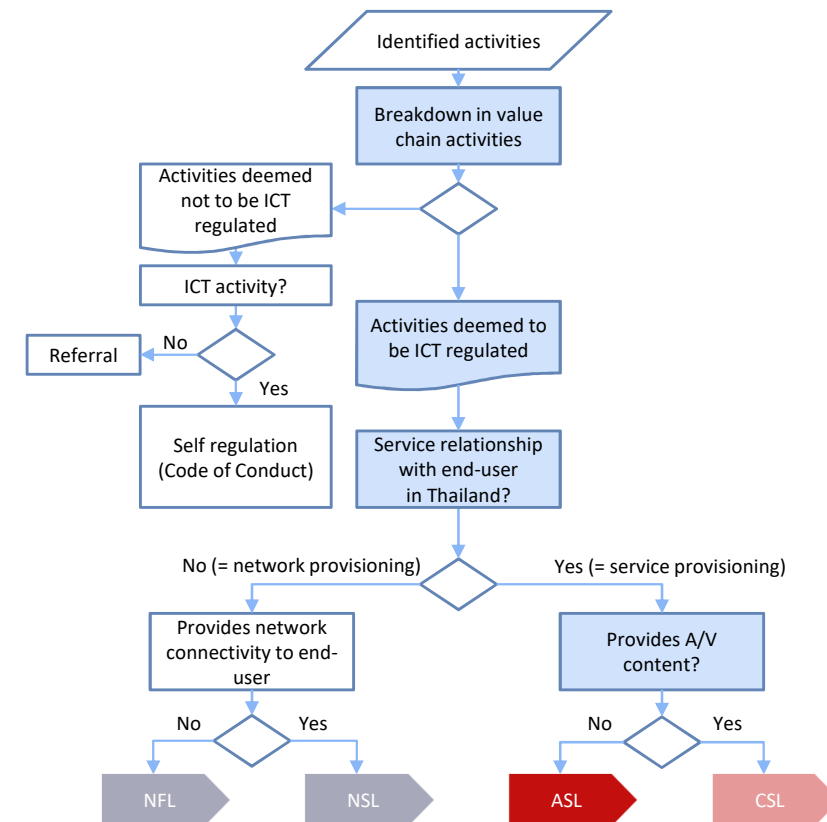
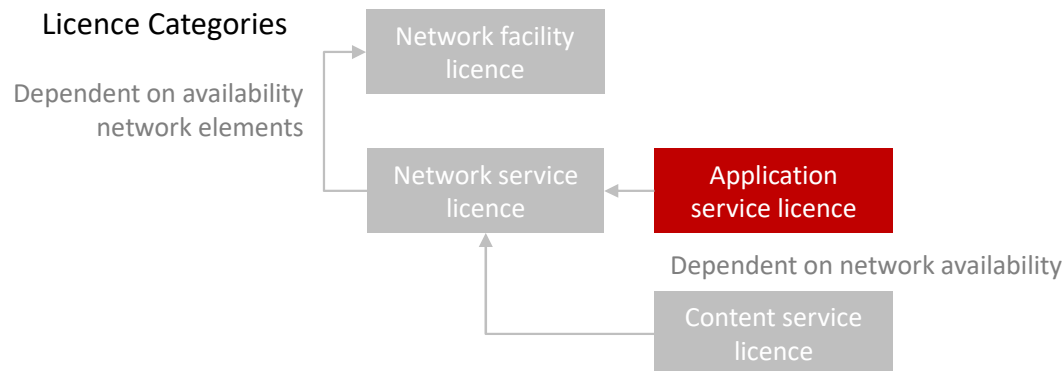
- Method
- Examples



Step 1 – Example 4 OTT telecom



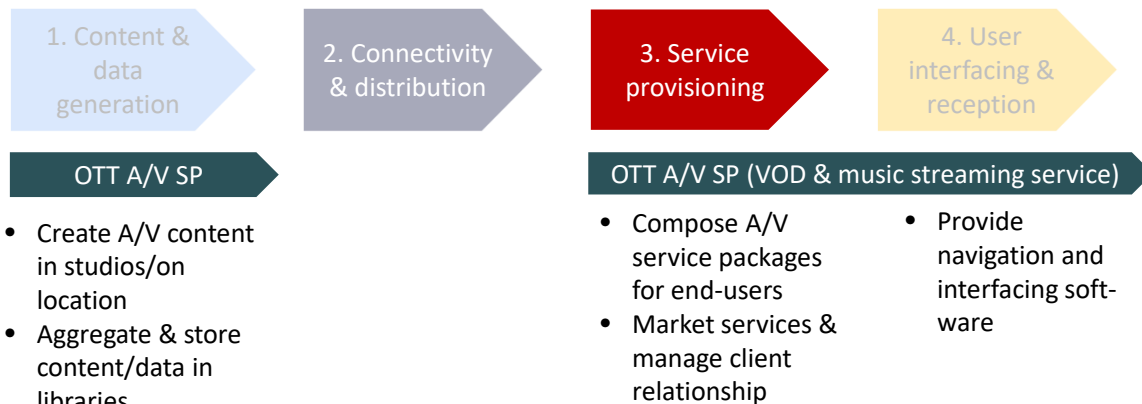
For example as provided by:   and MVNOs



Step 1 – Example 5 OTT A/V

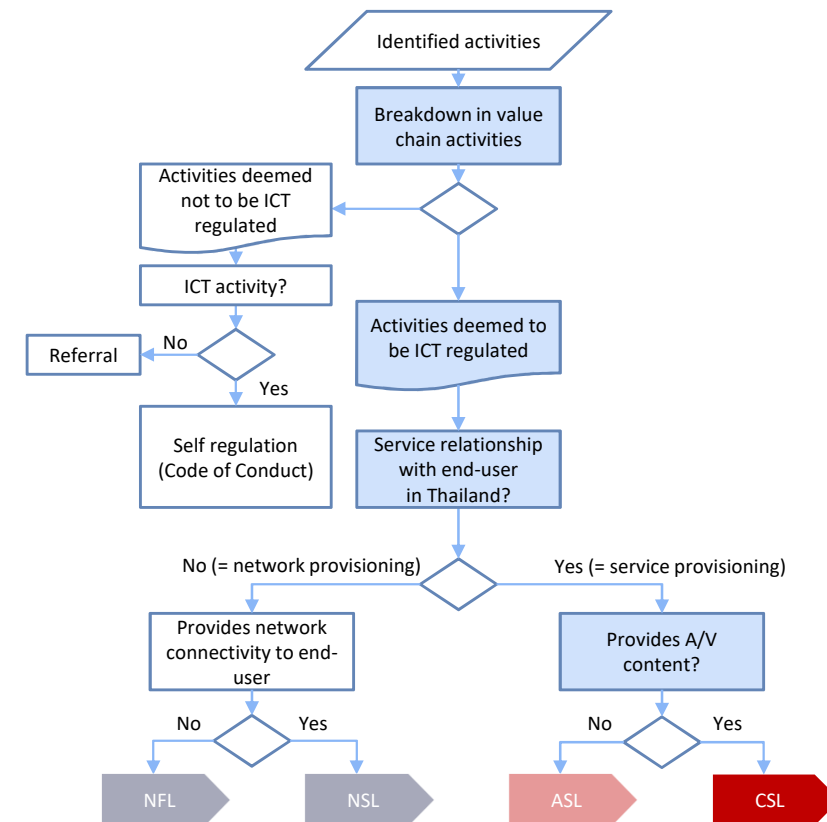
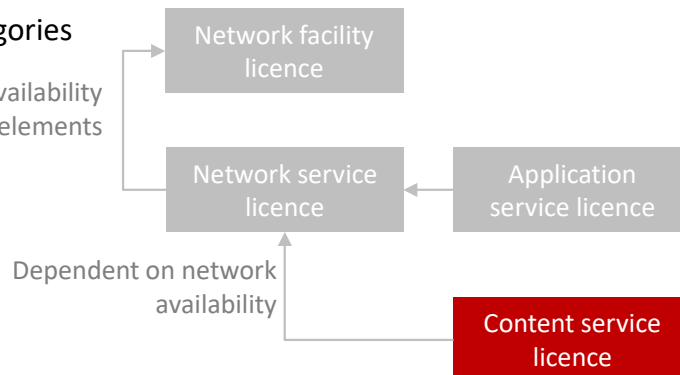


- Method
- Examples



Licence Categories

Dependent on availability network elements



Step 1 – Example ⑥ IoT LoRa based asset tracking

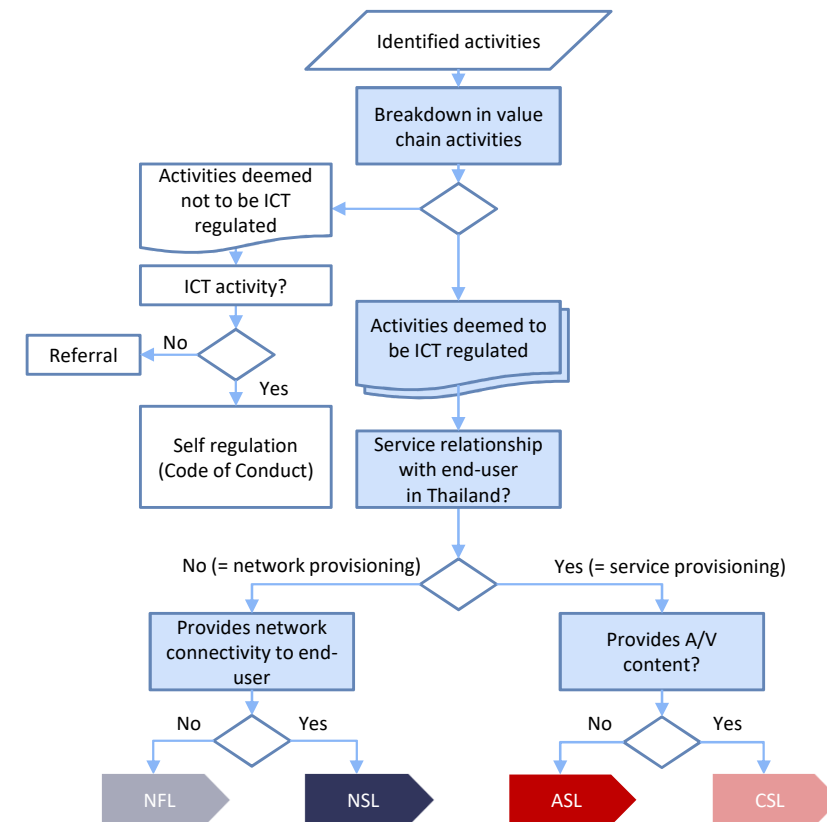
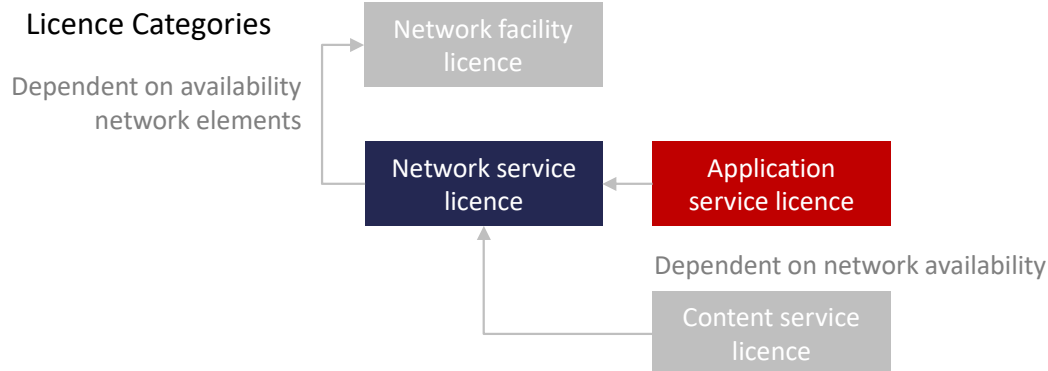


- Method
- Examples



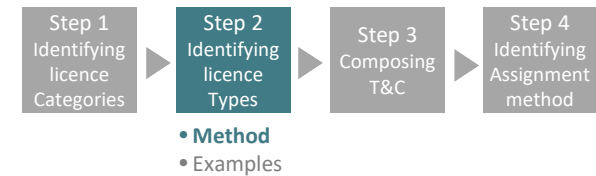
- Collect & structure machine generated data
- Aggregate & store content/data in libraries
- Provide managed network services for data delivery to *end-users*
- Compose service packages & applications for end-users
- Market service & manage client relationship
- Provide navigation & interfacing devices/soft-ware

For example as provided by: **CAT** & **SK telecom** in Phuket Smart City project

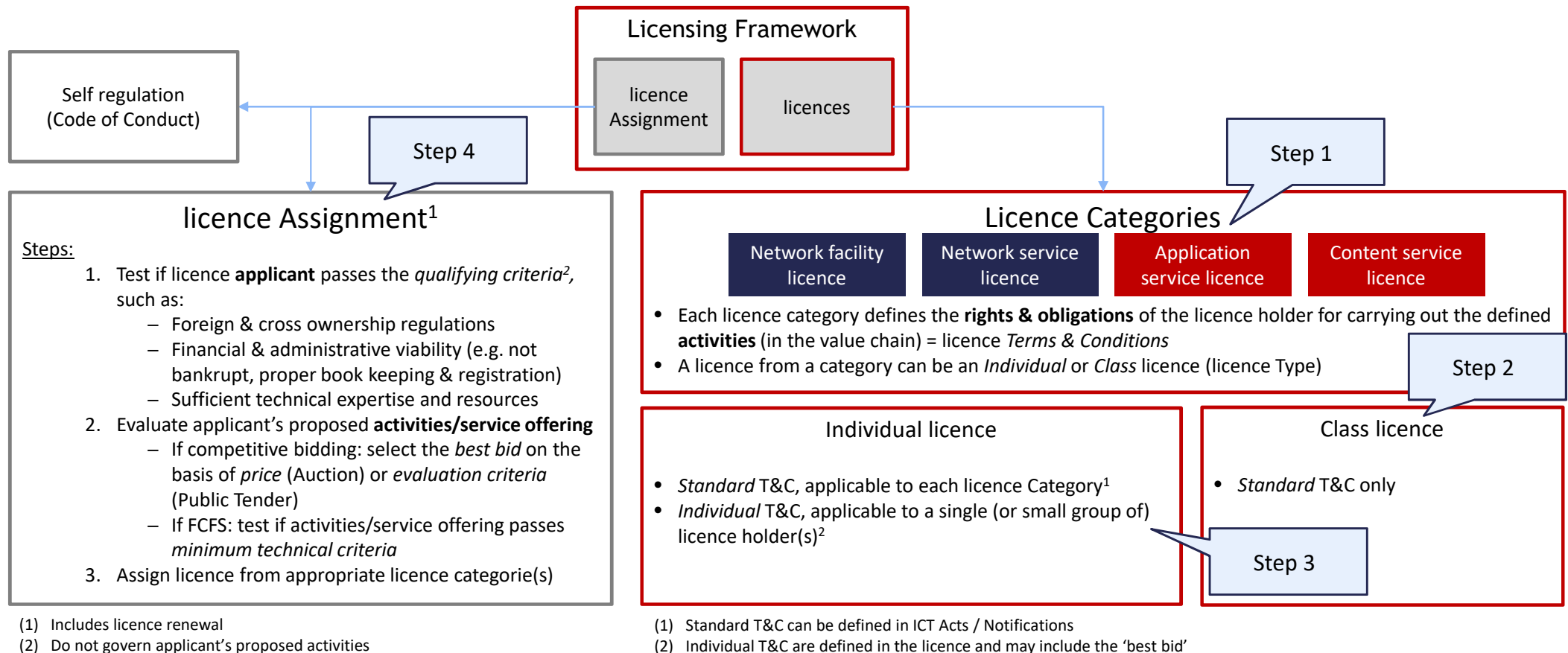




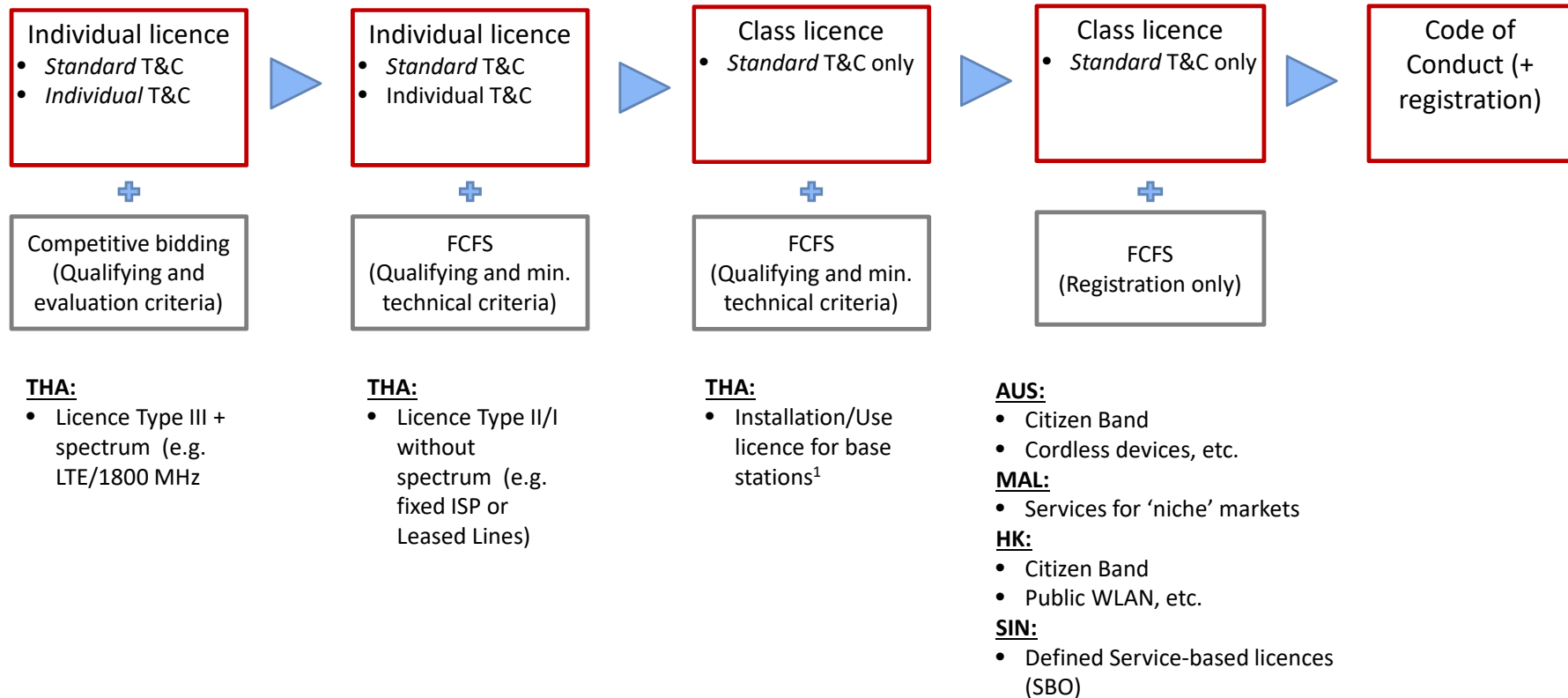
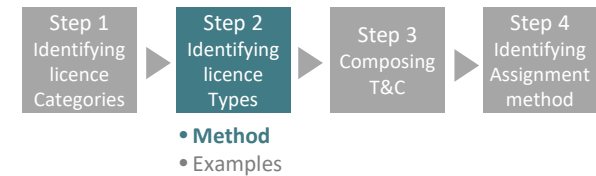
Step 2: Identifying Licence Types



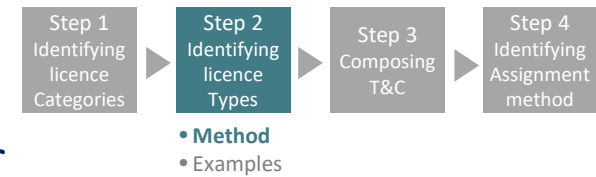
Step 2 – Licensing Framework overview



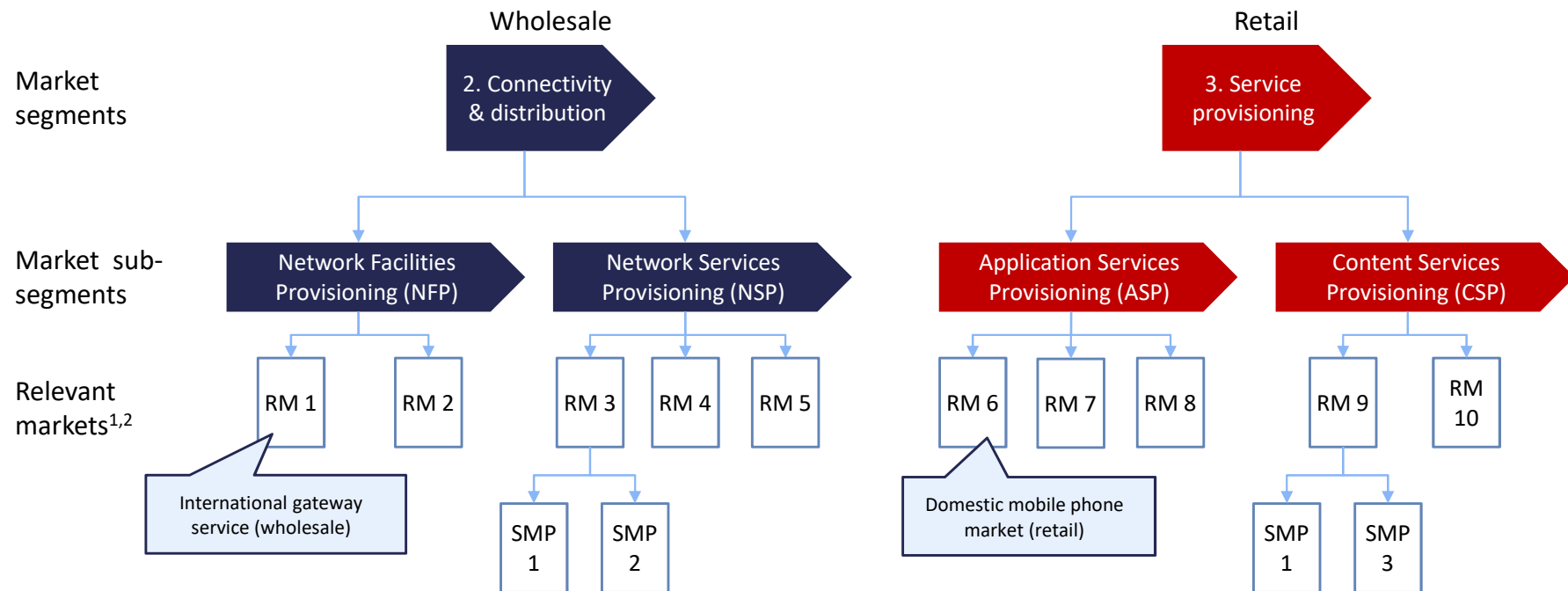
Step 2 – Licence Types and Assignment



(1) Class licences are not assigned in Thailand, although the individual licence for the Installation and Use of base stations are in their practical implementation the same

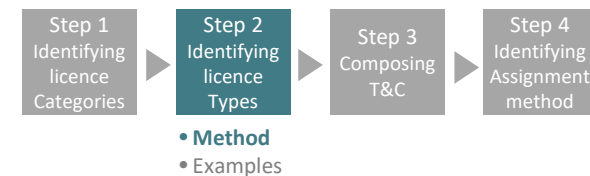


Step 2 - Relevant Markets and Significant Market Power



(1) Defined by NBTC, relevant market definitions regularly reviewed

(2) See also Annex A 'Details RM and SMP'



Step 2 - RMs and SMPs defined by NBTC

Relevant Markets (8x) ^{1,2}	SMP operators (5x)		T&C (specific measures)	T&C No. in CLF model
1. Domestic mobile phone market (retail)	AIS	DTAC	1. Separate the accounts by type of service and report accordingly 2. Submit the data as specified TUSOA 3. Comply with Notification 'Maximum Rate of Service fees' (retail only) 4. Provide unbundled network services, and permit others to access and interconnect (wholesale only) 5. Report on items 3 and 4 for compliancy monitoring	1. A2.0
2. Domestic mobile network service (wholesale)	AIS	DTAC		2. A2.0
3. Domestic fixed line market (retail)	TOT			3. S3.0
4. High speed internet in the market (retail)	TOT	True		4. N4.0
5. Domestic fixed line network service (wholesale)	TOT			5. A2.0
6. International call market (retail)	CAT			
7. International gateway service (wholesale)	CAT			
8. Internat. internet gateway service (wholesale)	CAT			

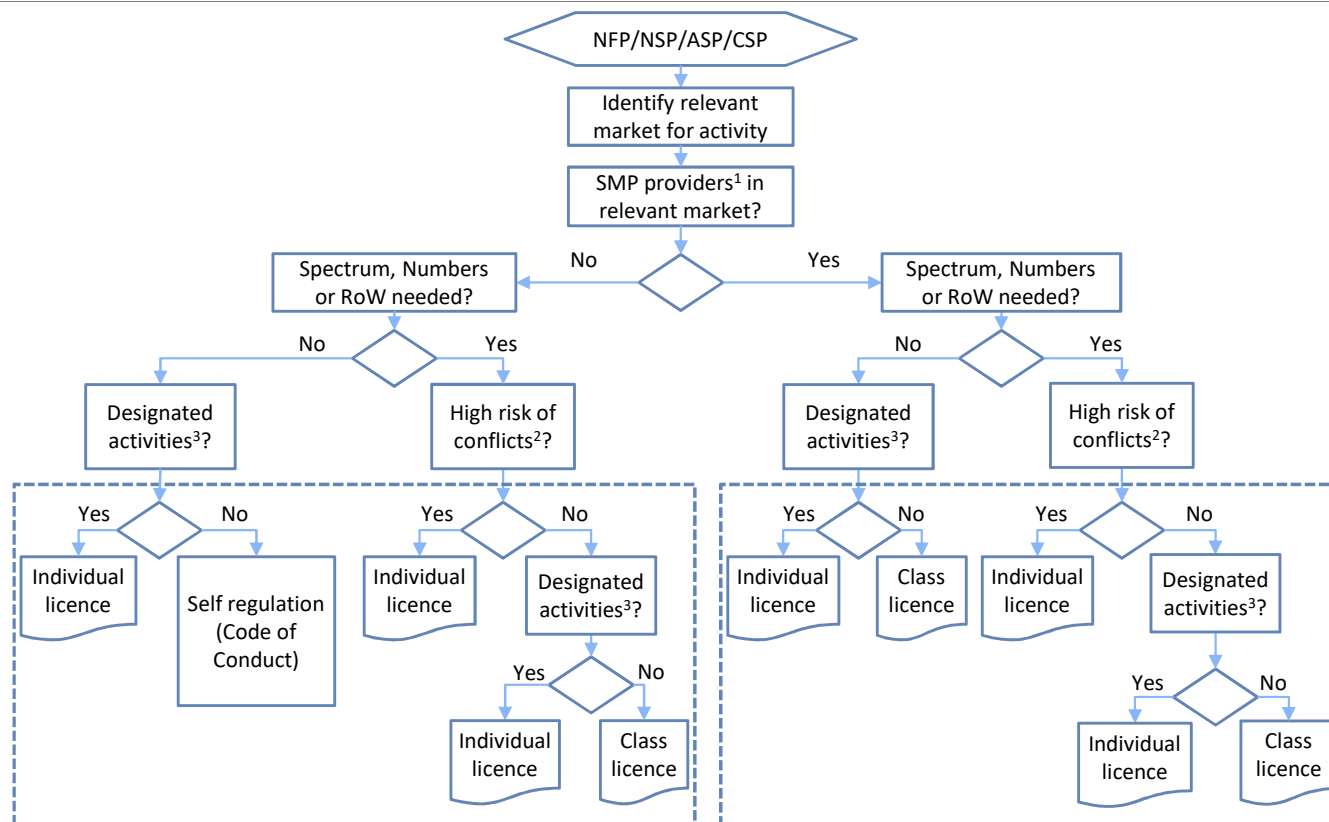
No mobile high speed Internet (retail) ?

- (1) Order of the National Telecommunications Commission No. 32/ 2553 (2010), Re: Identifying Operators with Significant Market Power in Each Relevant Market And the Operators with Significant Market Power to Comply with Specific Measures. This order has been replaced by a order in 2014, but without English translation. However, other definitions of the RM do not change the proposed methodology
- (2) More details on the definition of Relevant Markets and parties with Significant Market Power can be found in the Annex A

Step 2 – Overview



- **Method**
- Examples

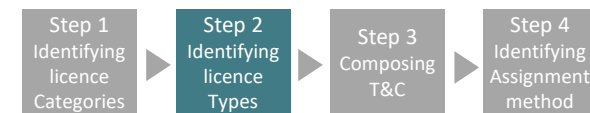


- (1) Ex-ante defined by NBTC
- (2) High risk of interference or incompatibilities between licensees' activities
- (3) Designated tasks such as USO activities or ensuring National Security, Emergency & Disaster relief

- Code of conduct/self regulation possible (as market is considered fully competitive)
- Lighter T&C applied

- Class and individual licences only (as market is characterised as limited competitive)
- Stricter T&C applied
- T&C apply for SMP providers

Step 2 – Example 1 Backbone network



- Method
- Examples

2. Connectivity
& distribution

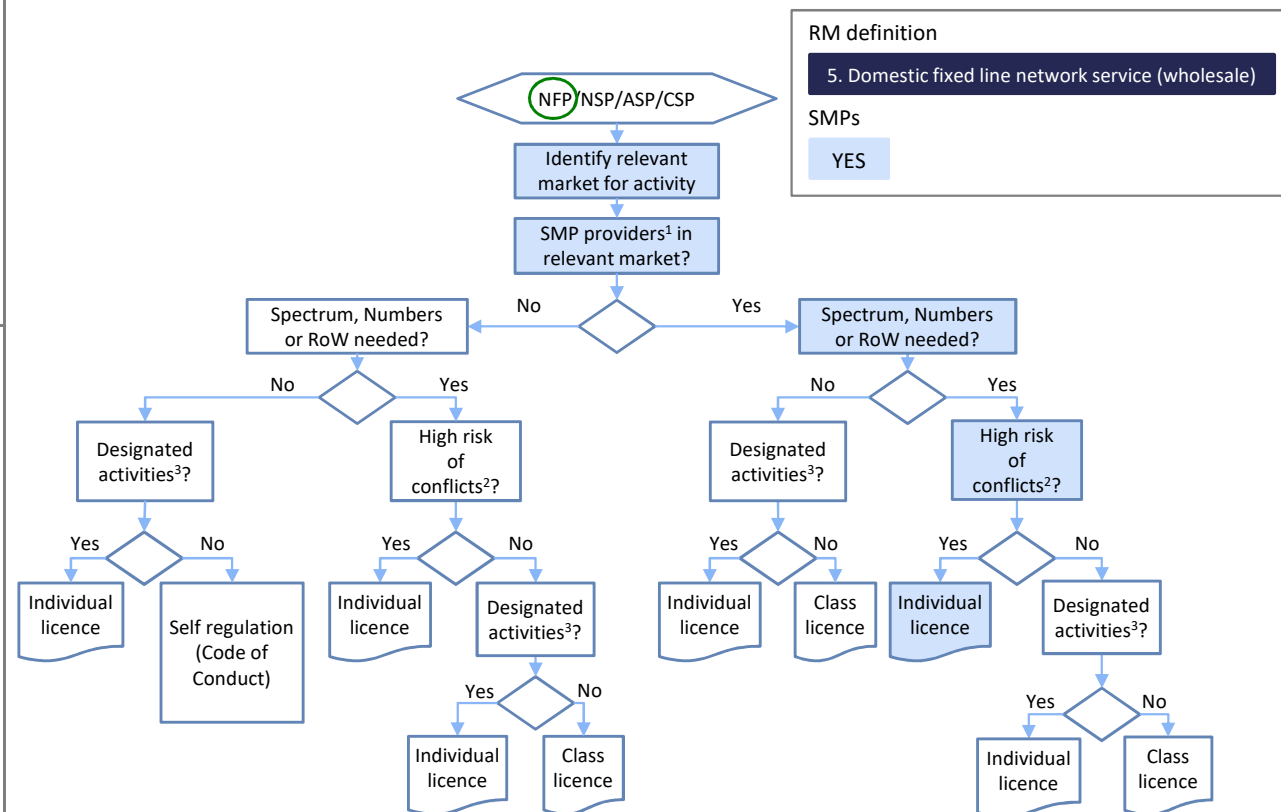
Backbone (IP)
network

Individual
Network facility
licence

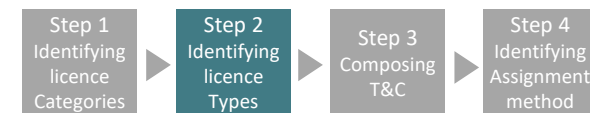
Network service
licence

Application
service licence

Content service
licence



Step 2 – Example 2 Fixed ISP



- Method
- Examples

2. Connectivity
& distribution

3. Service
provisioning

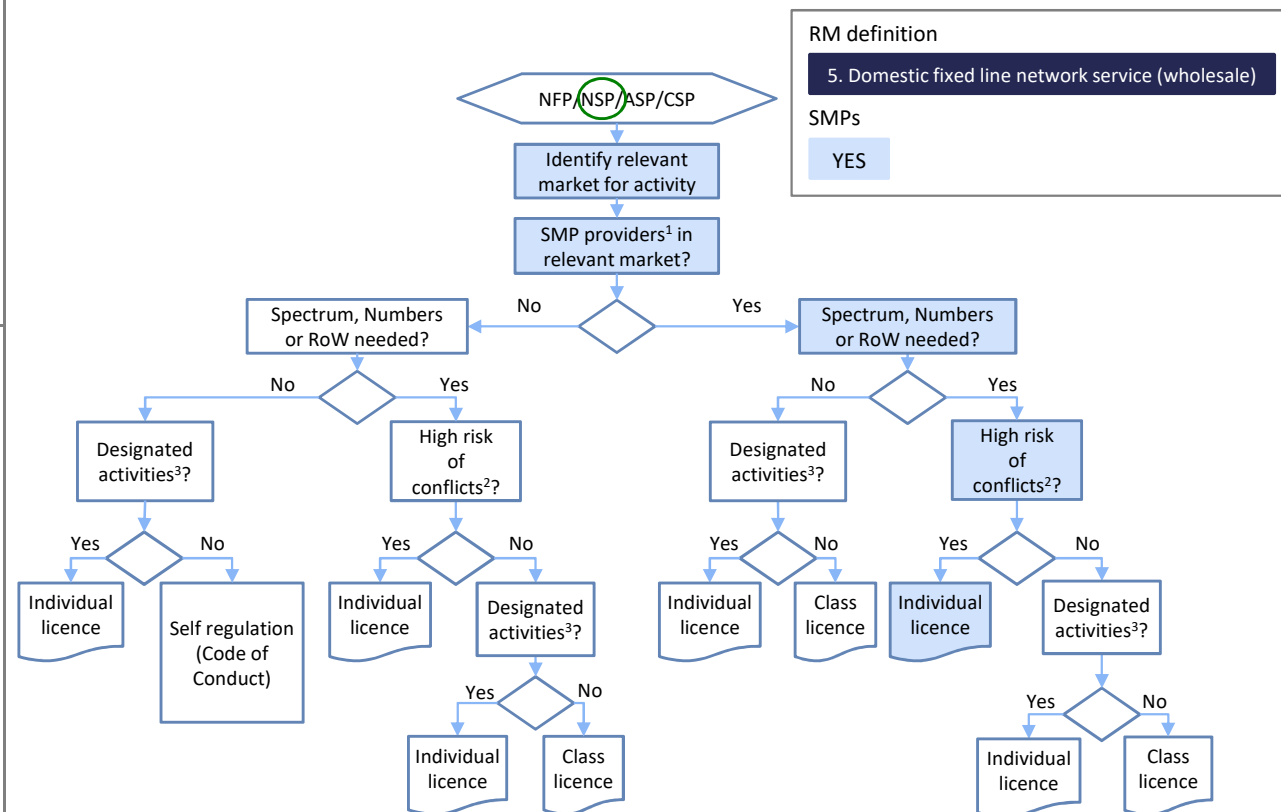
Incumbent fixed ISP (Internet access)

Network facility
licence

Individual
Network service
licence

Application
service licence

Content service
licence



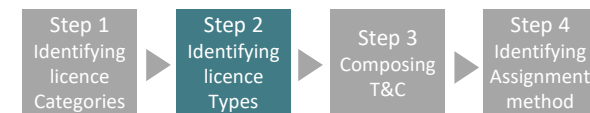
RM definition

5. Domestic fixed line network service (wholesale)

SMPs

YES

Step 2 – Example 2 Fixed ISP



- Method
- Examples

2. Connectivity
& distribution

3. Service
provisioning

Incumbent fixed ISP (Internet access)

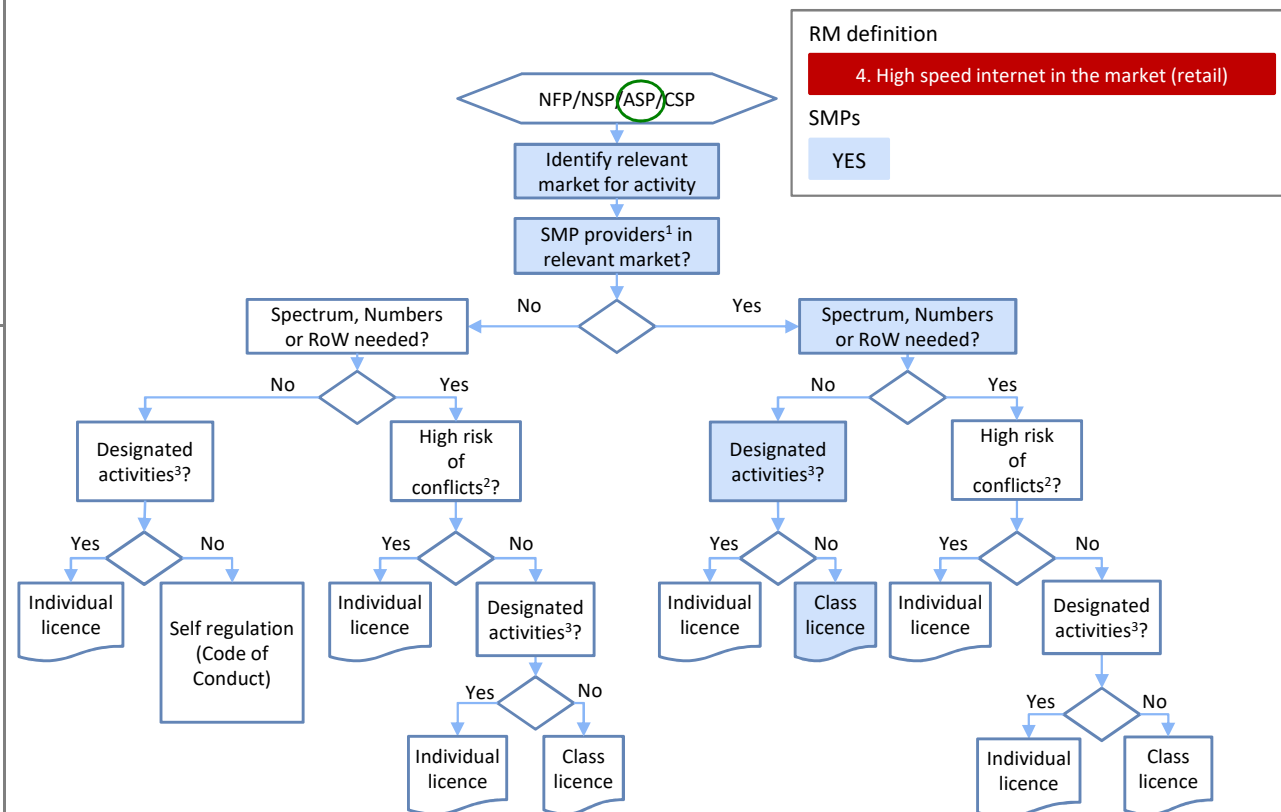
Network facility
licence

Individual
Network service
licence

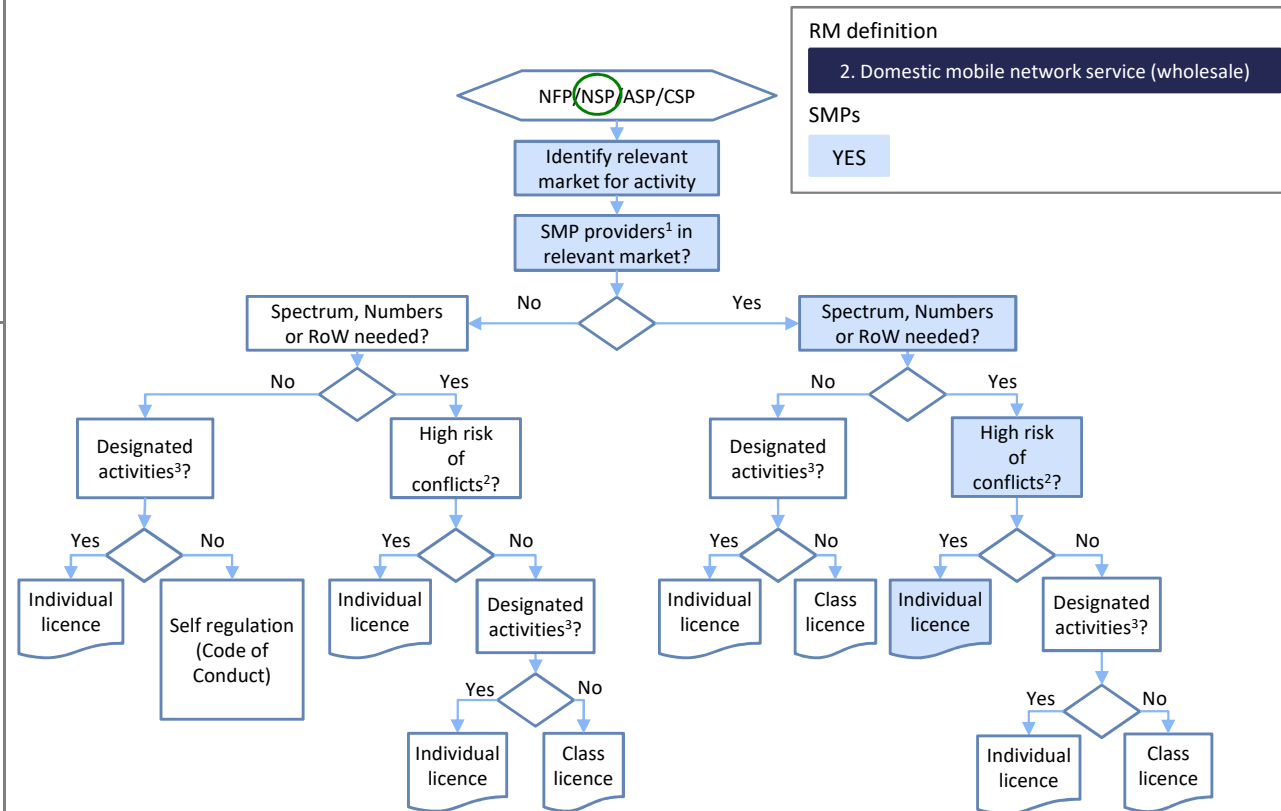
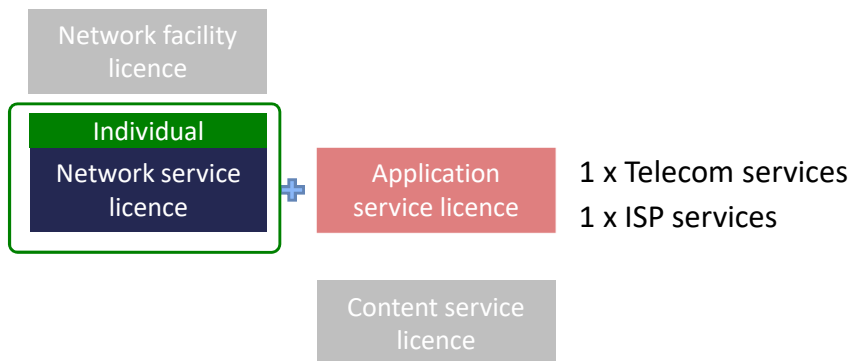
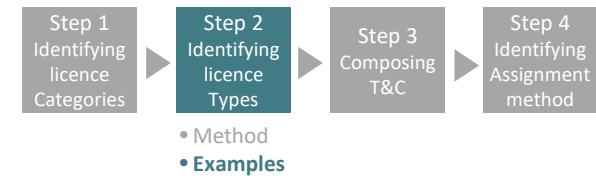
ISP services

Class
Application
service licence

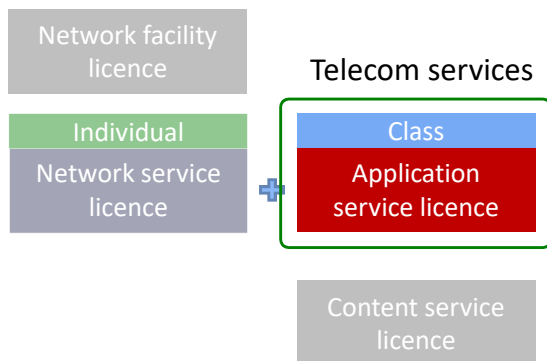
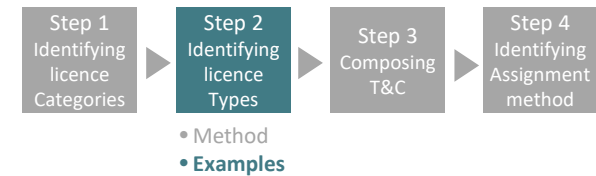
Content service
licence



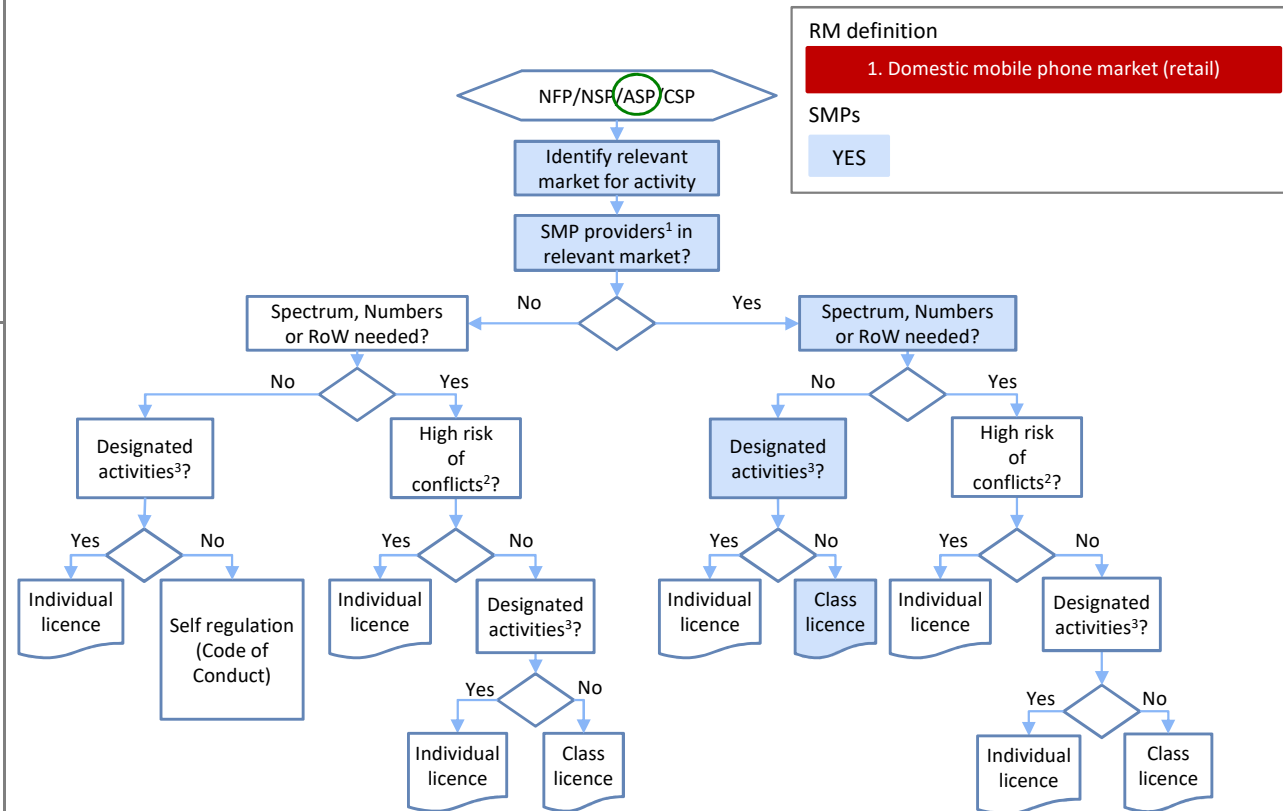
Step 2 – example ③ Mobile telecom & internet



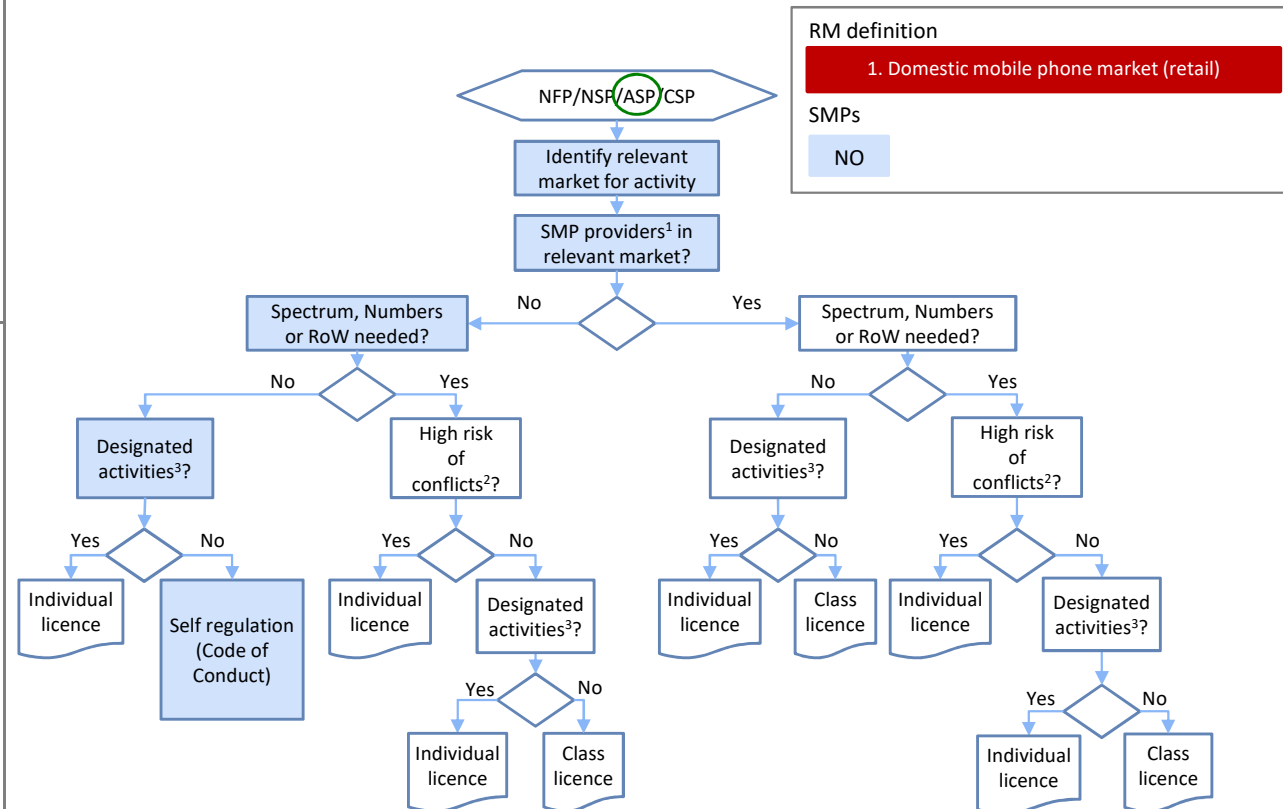
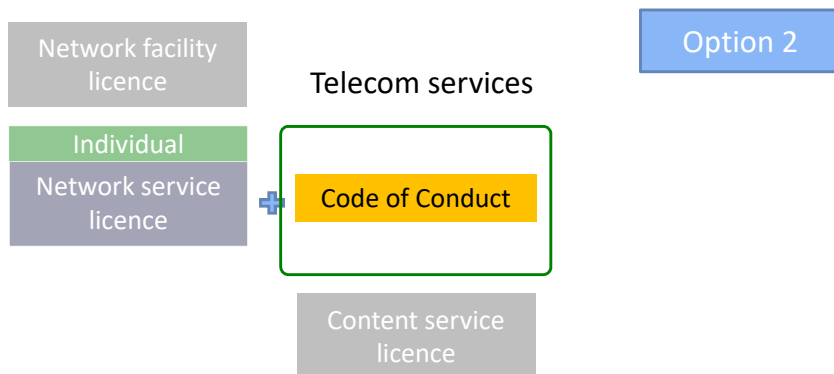
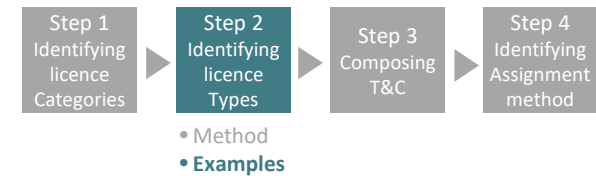
Step 2 – Example ③ Mobile telecom & internet



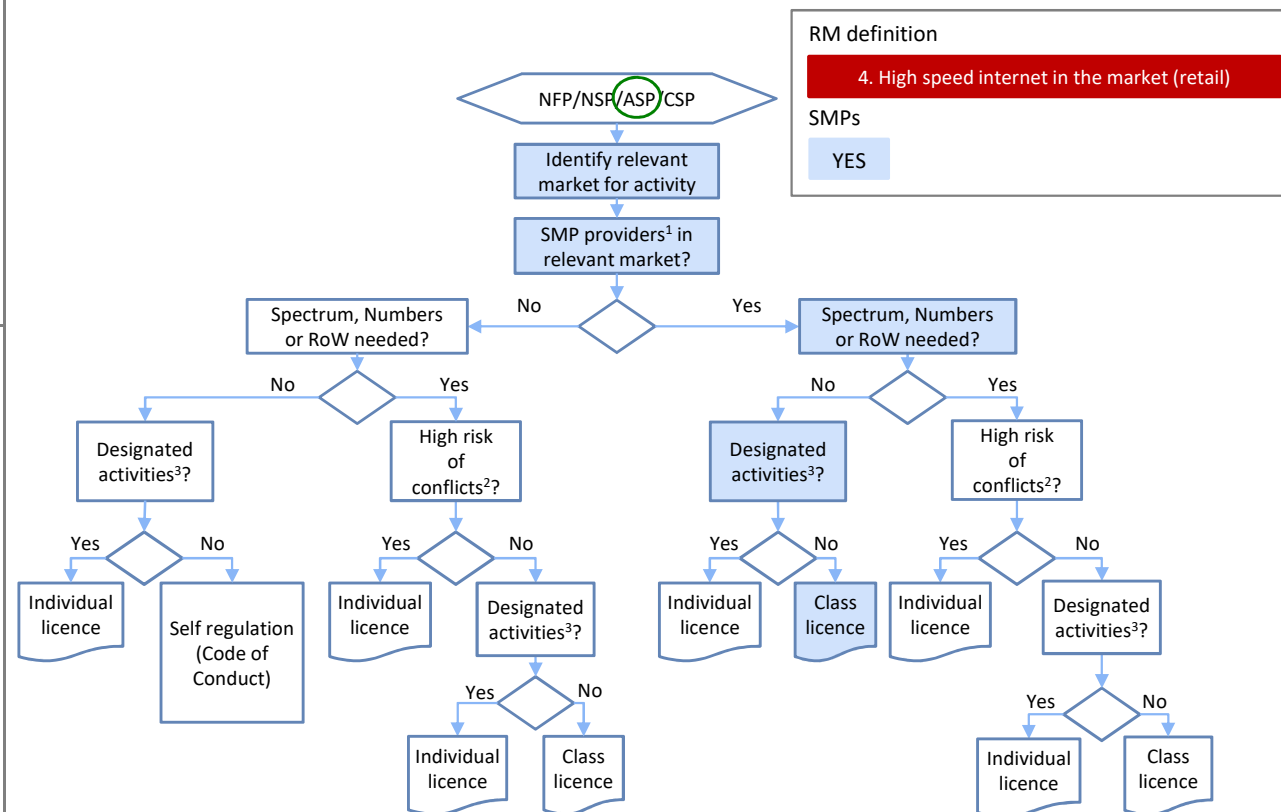
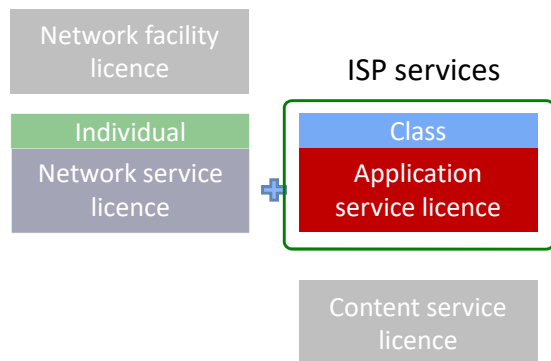
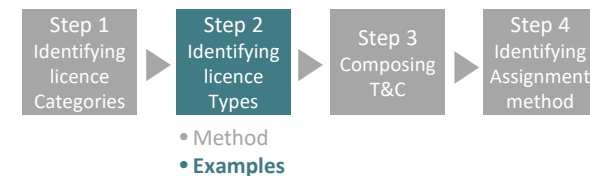
Option 1



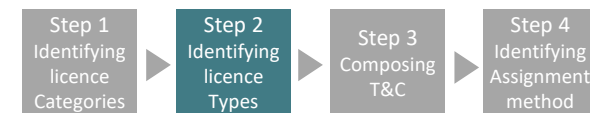
Step 2 – Example ③ Mobile telecom & internet



Step 2 – Example ③ Mobile telecom & internet



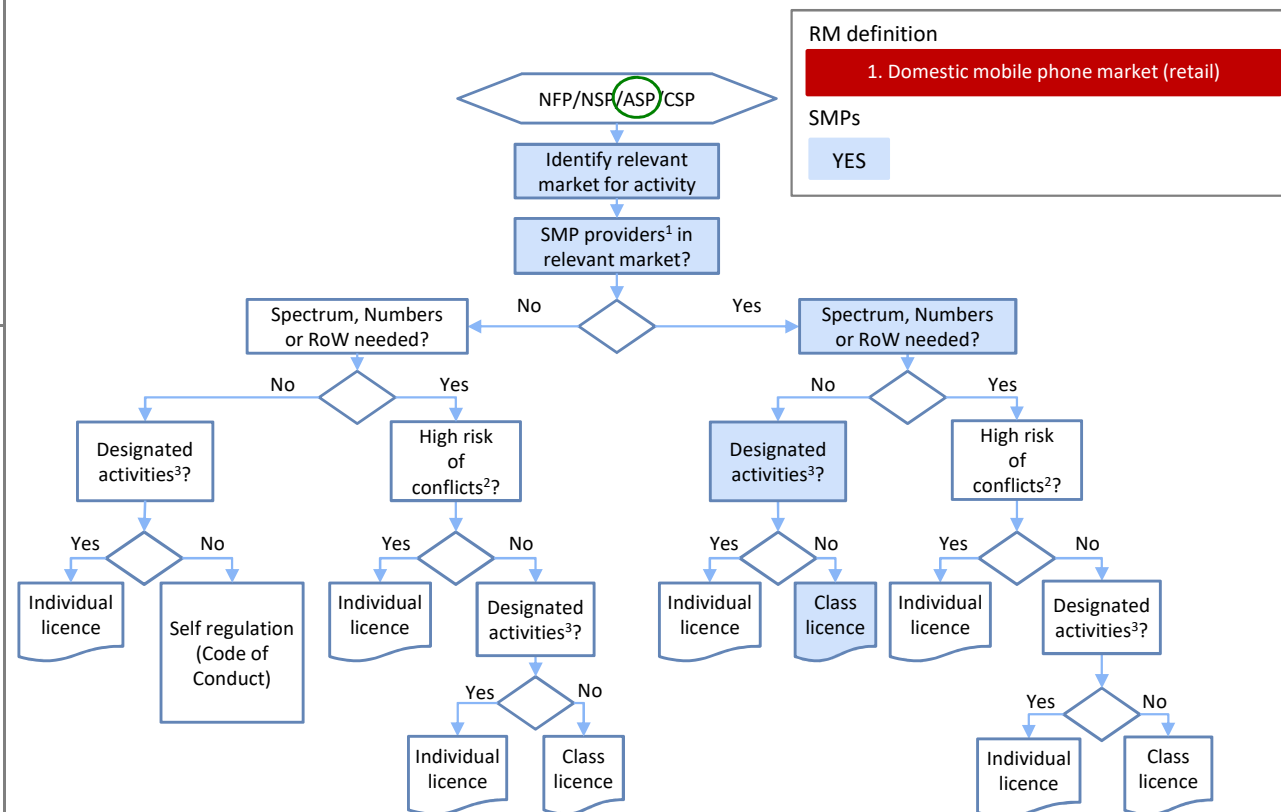
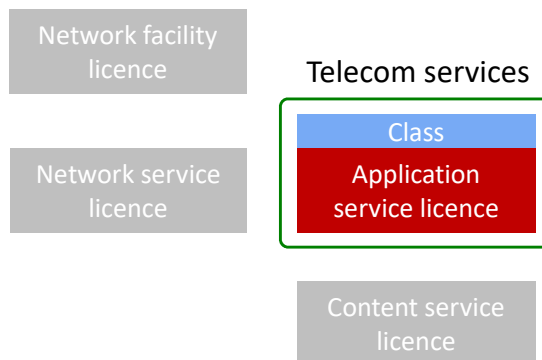
Step 2– Example 4 - OTT telecom



- Method
- Examples



Option 1



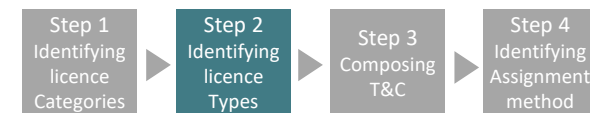
RM definition

1. Domestic mobile phone market (retail)

SMPs

YES

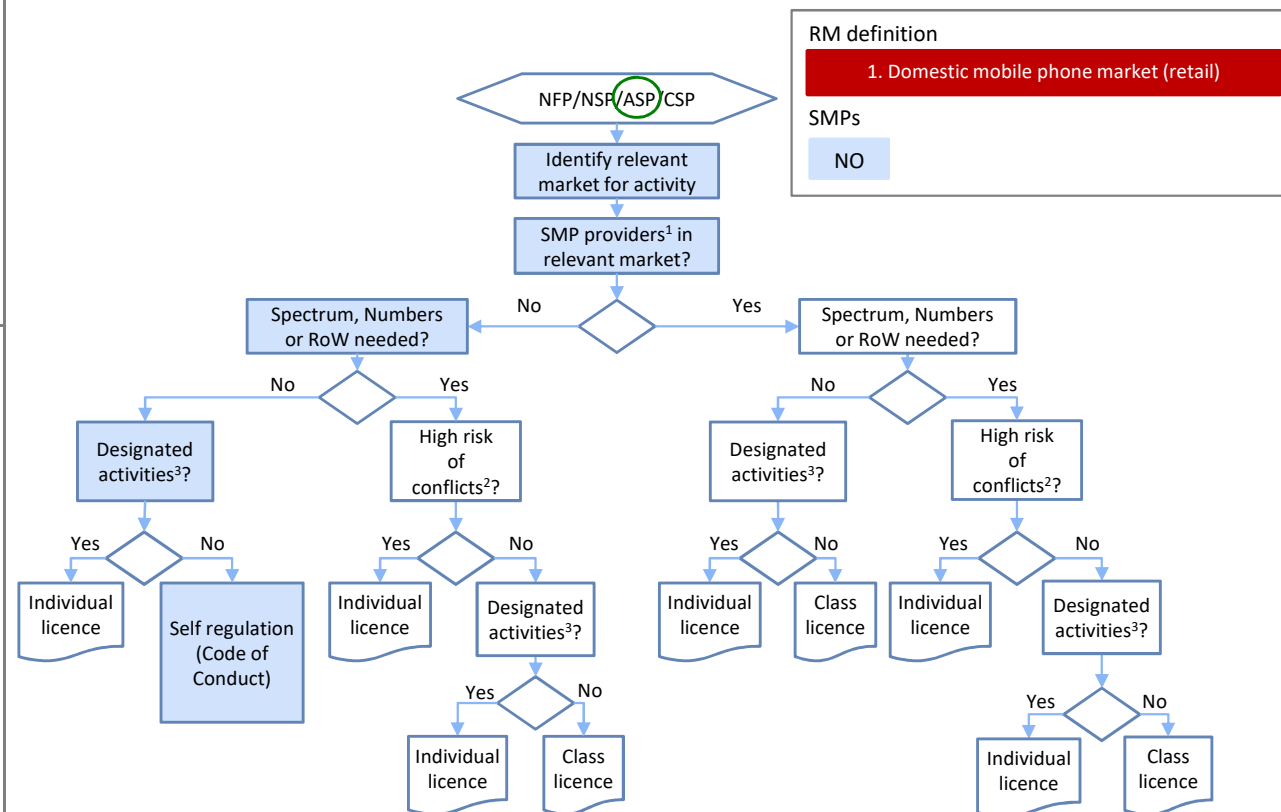
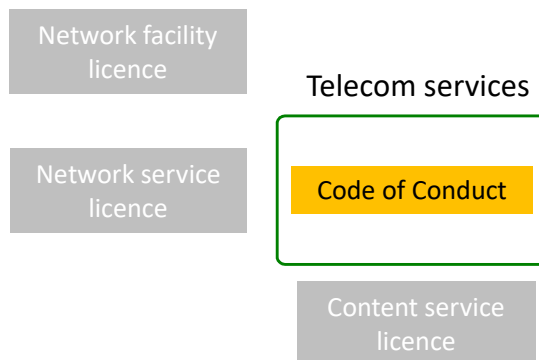
Step 2 – Example 4 - OTT telecom



- Method
- Examples



Option 2



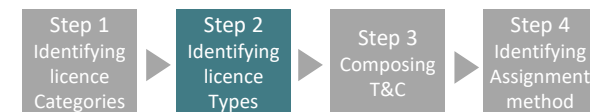
RM definition

1. Domestic mobile phone market (retail)

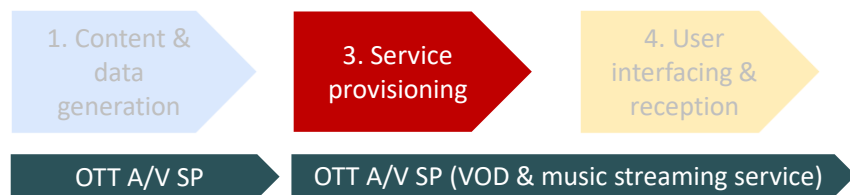
SMPs

NO

Step 2– Example 5 - OTT A/V



- Method
- Examples

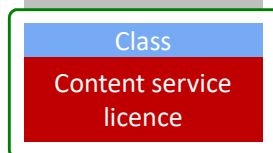


Option 1

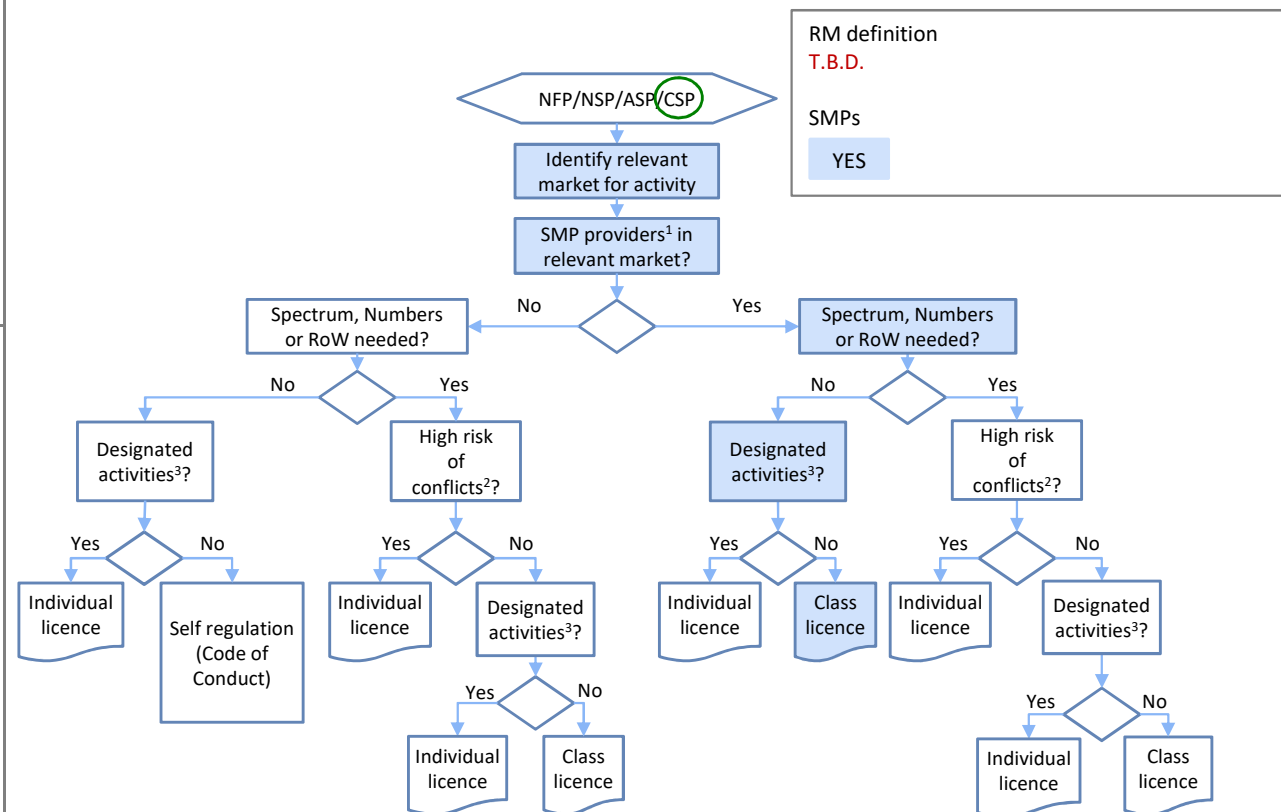
Network facility
licence

Network service
licence

Application
service licence



A/V services



RM definition

T.B.D.

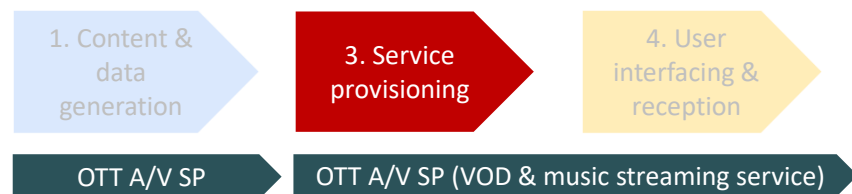
SMPs

YES

Step 2– Example 5 - OTT A/V



- Method
- Examples



Network facility
licence

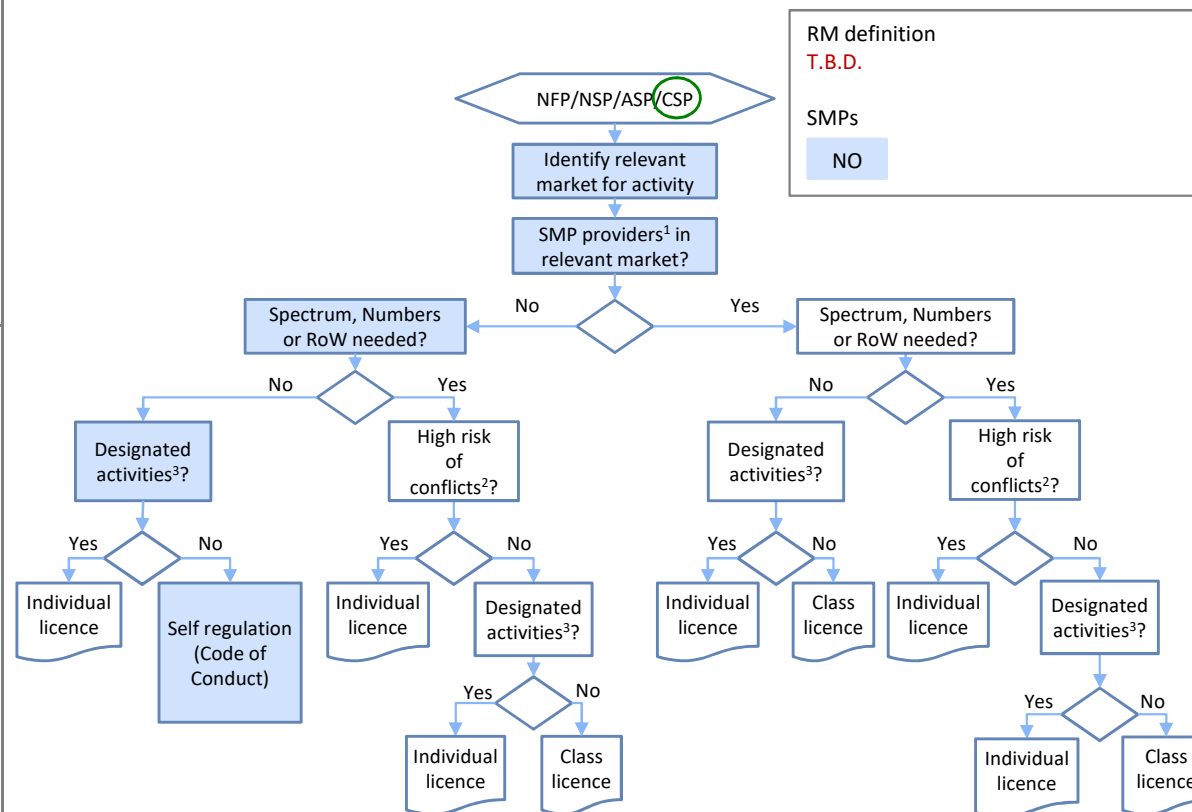
Network service
licence

Application
service licence

Code of Conduct

A/V services

Option 2



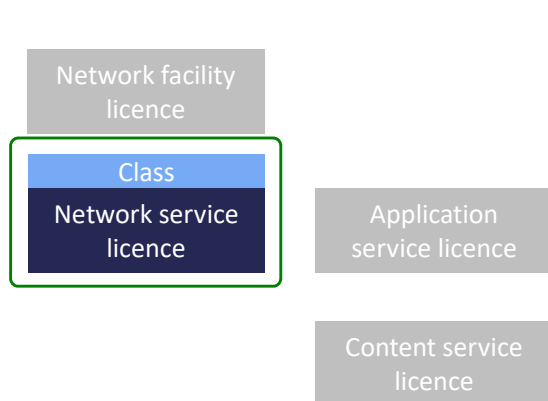
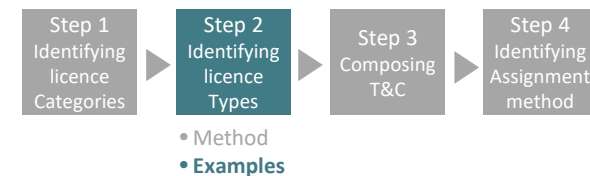
RM definition

T.B.D.

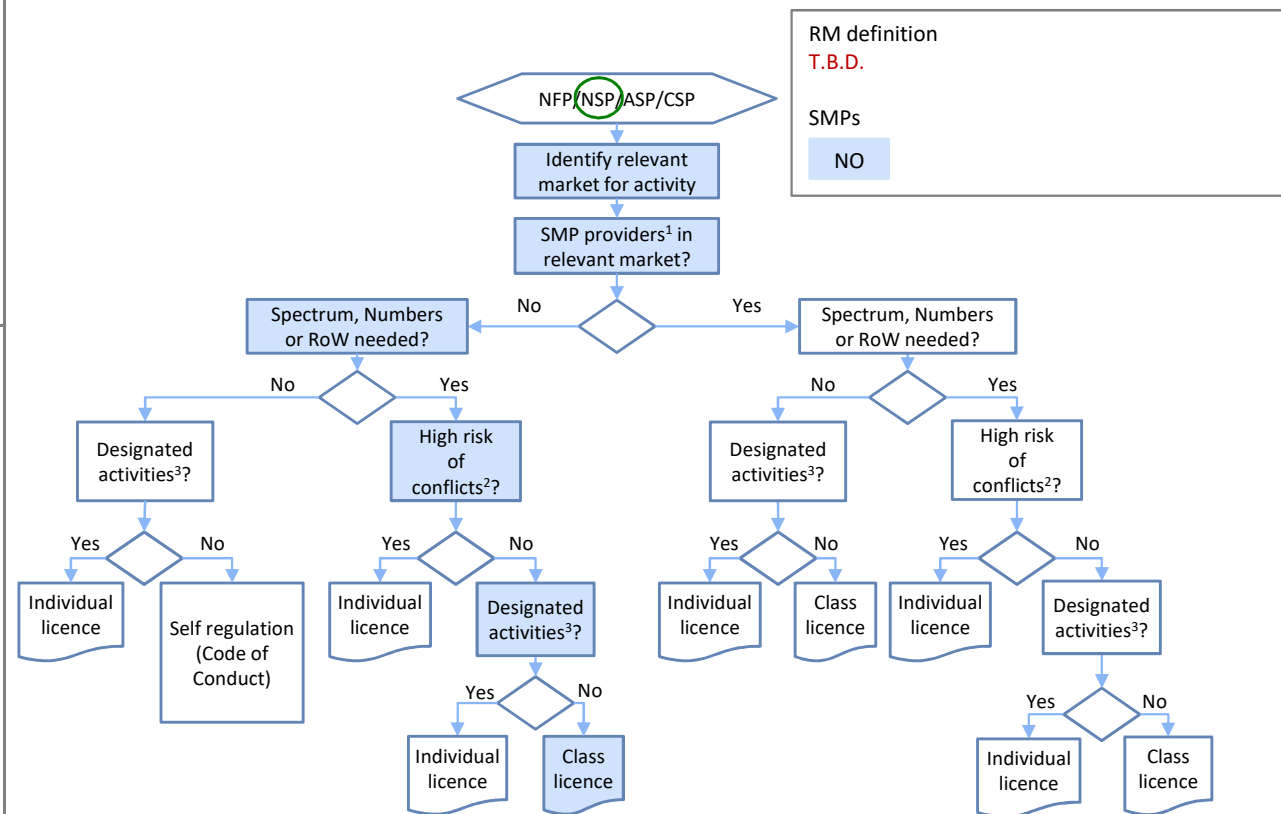
SMPs

NO

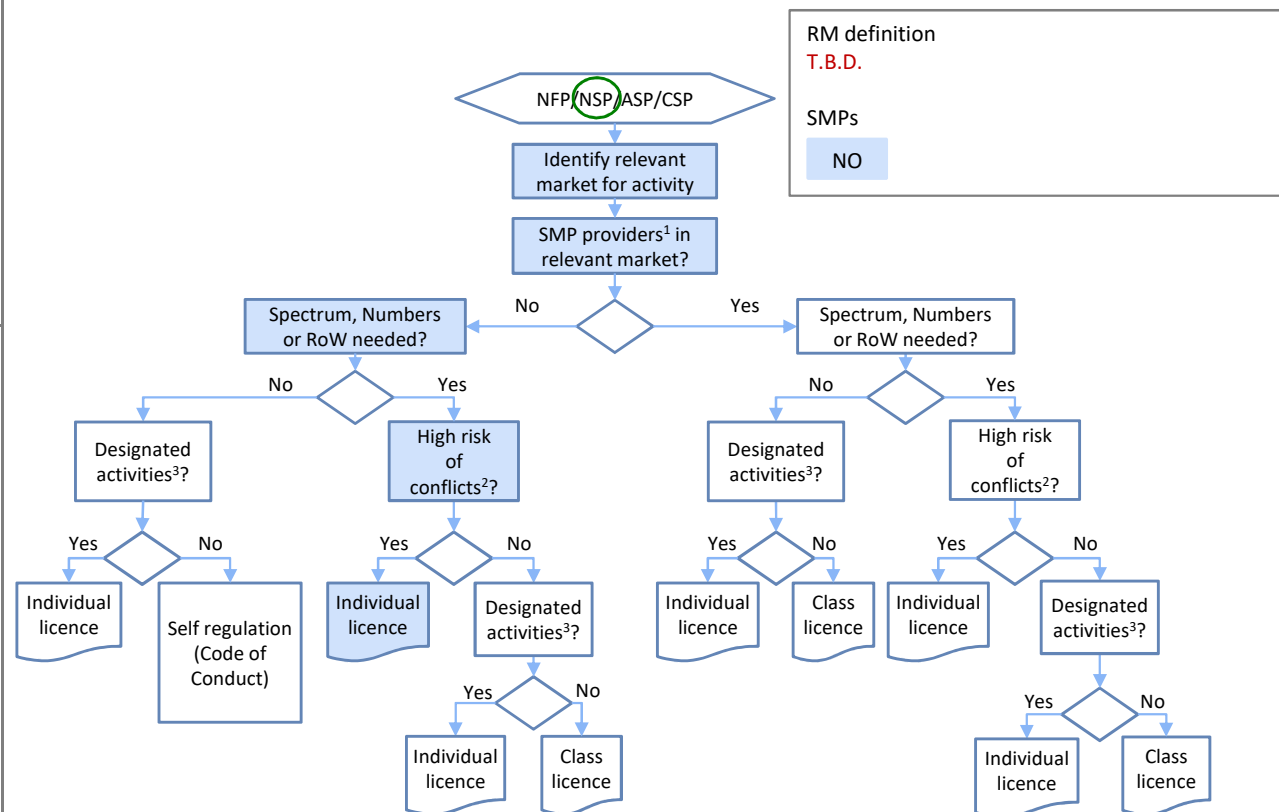
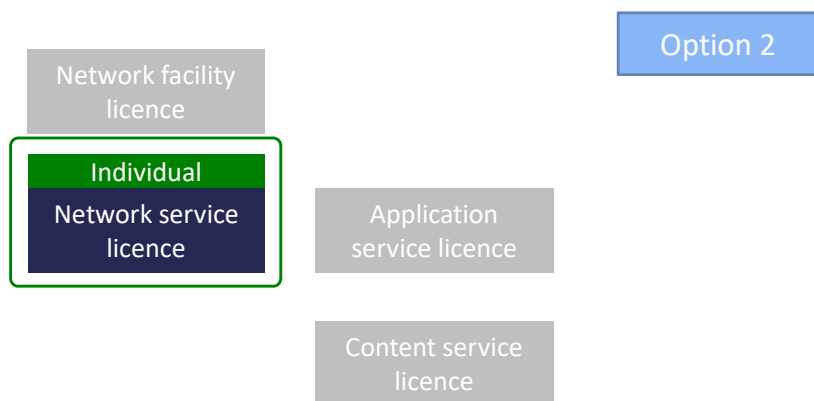
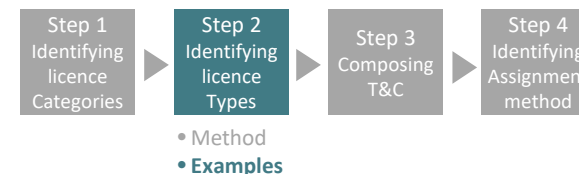
Step 2– Example 6 - IoT LoRa based asset tracking



Option 1



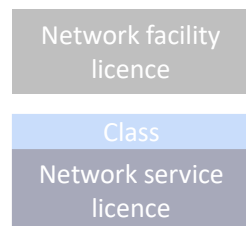
Step 2– Example 6 - IoT LoRa based asset tracking



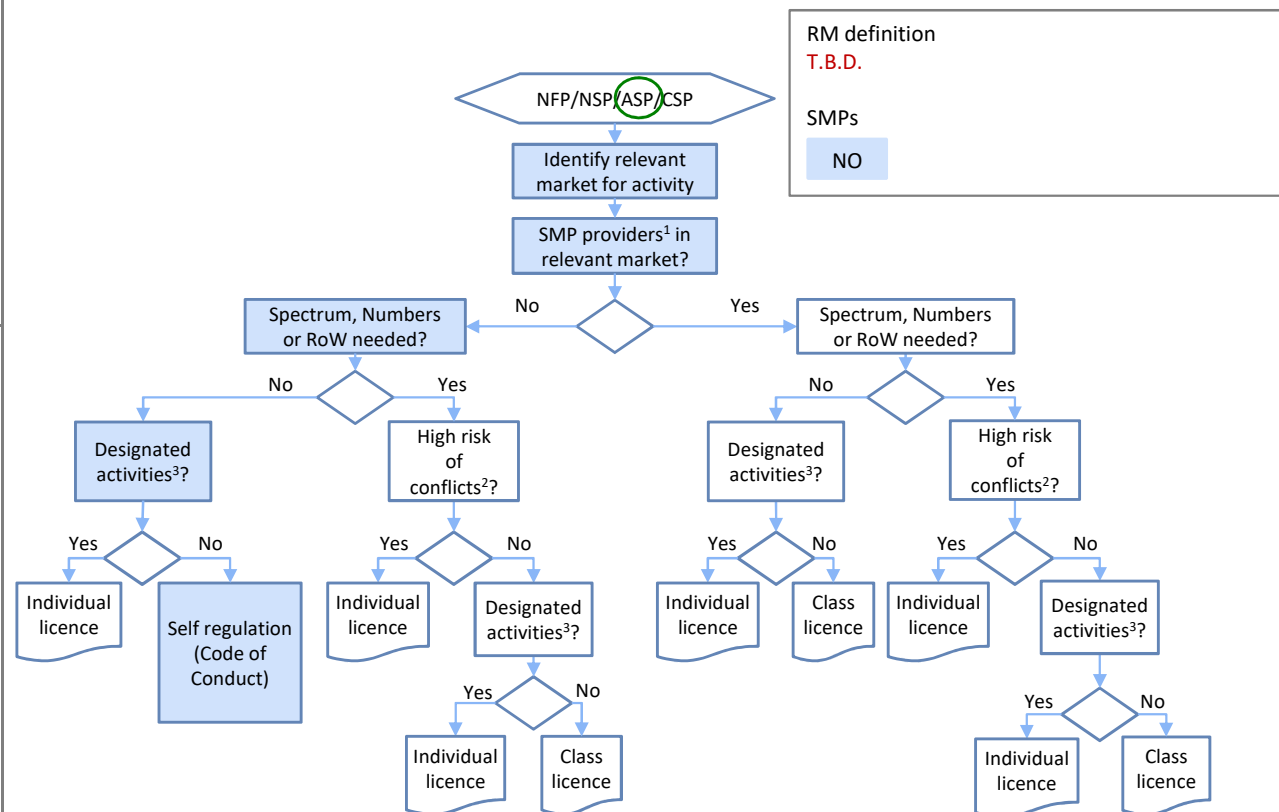
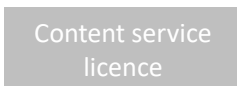
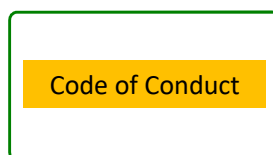
Step 2– Example 6 - IoT LoRa based asset tracking



- Method
- Examples

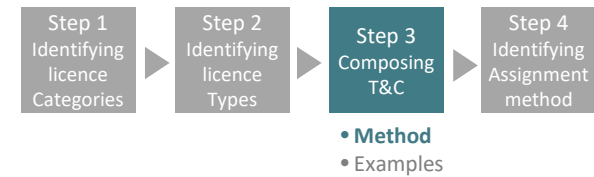


Tracking services





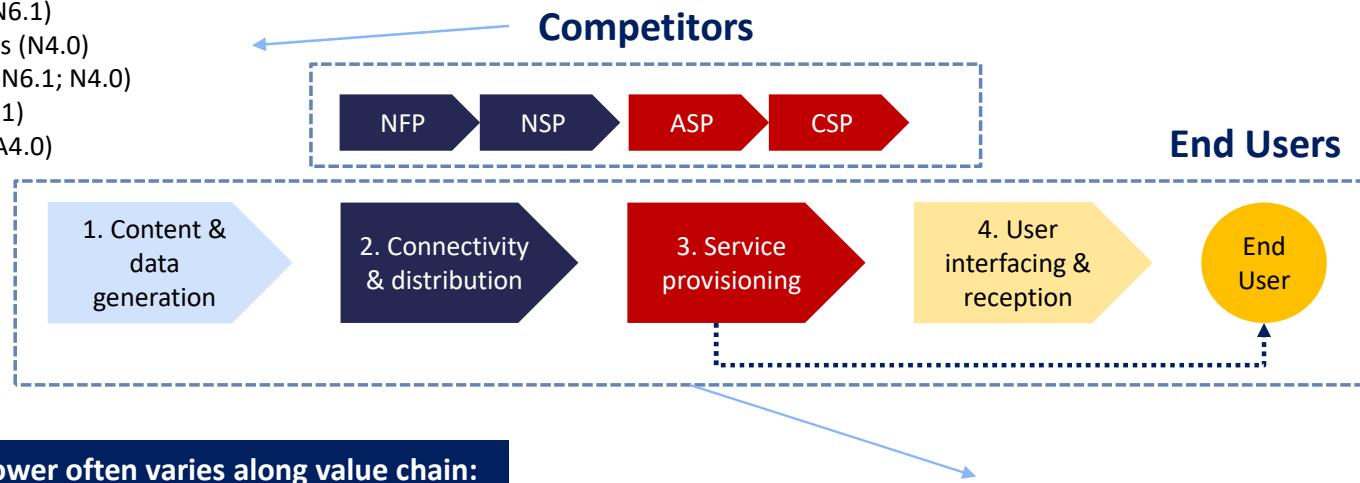
Step 3: Composing T&C



Step 3 - Value Chain and policy objectives

Policy objectives:

1. Universal service availability (S2.1; N3.3)
2. Access rules (N4.0; N6.1)
3. Interconnection rates (N4.0)
4. Non-discrimination (N6.1; N4.0)
5. No interference (N7.1)
6. Dispute resolution (A4.0)



Policy objectives:

1. Service availability (S2.1)
2. Quality of Service (S2.2)
3. Fair prices and conditions (S3.0)
4. Freedom of choice/no lock-in (S5.0)
5. Privacy protection (S6.0)
6. Consumer protection (S4.0)

Bargaining power often varies along value chain:

- Parties with SMP may abuse power
- Interlinked companies may block competitors
- Unfair pricing by dominant parties
- Some facilities/services are essential
- Implications for terms and conditions:
 - Objectives needed for determining T&C
 - Position in value chain matters

Society



Policy objectives:

1. Health, Safety and Environmental protection (N7.2)
2. (National) Security (N10.0; S8.0)
3. Morality (C4.0)
4. Protection from harmful content (C4.0; C2.0; C3.0)
5. Protection of local culture (C2.0)



- Method
- Examples

Step 3 – Standard list of T&C per licence Category

	Network facility licence	Network service licence		
Additional rights	Spectrum		R1.0	R
	Numbers	<i>Dialling numbers</i>	R2.1	R
		<i>LCNs</i>	R2.2	R
	Right of Way	<i>Overhead trajectories</i>	R3.1	R
		<i>Cable ducts</i>	R3.2	R
Network Operations	Operating right		N1.0	R
	Network service levels	<i>Deployment schedule</i>	N3.1	O
		<i>Coverage target(s)</i>	N3.2	O
		<i>Network (element) availability</i>	N3.3	O
	Network access & pricing (1)		N4.0	R/O
	Network capacity & pricing (2)		N5.0	R/O
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O
		<i>Antennas</i>	N6.2	R/O
		<i>Power & cooling</i>	N6.3	R/O
	Technical criteria	<i>Interference</i>	N7.1	O
		<i>Proper conduct & standards</i>	N7.2	O
	Net neutrality		N8.0	O/R
Admin provisions	Emergency & Disaster		N9.0	O
	National security		N10.0	O
	Fees		A1.0	O
	Reporting		A2.0	O
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O
	Generic provisions		A4.0	O

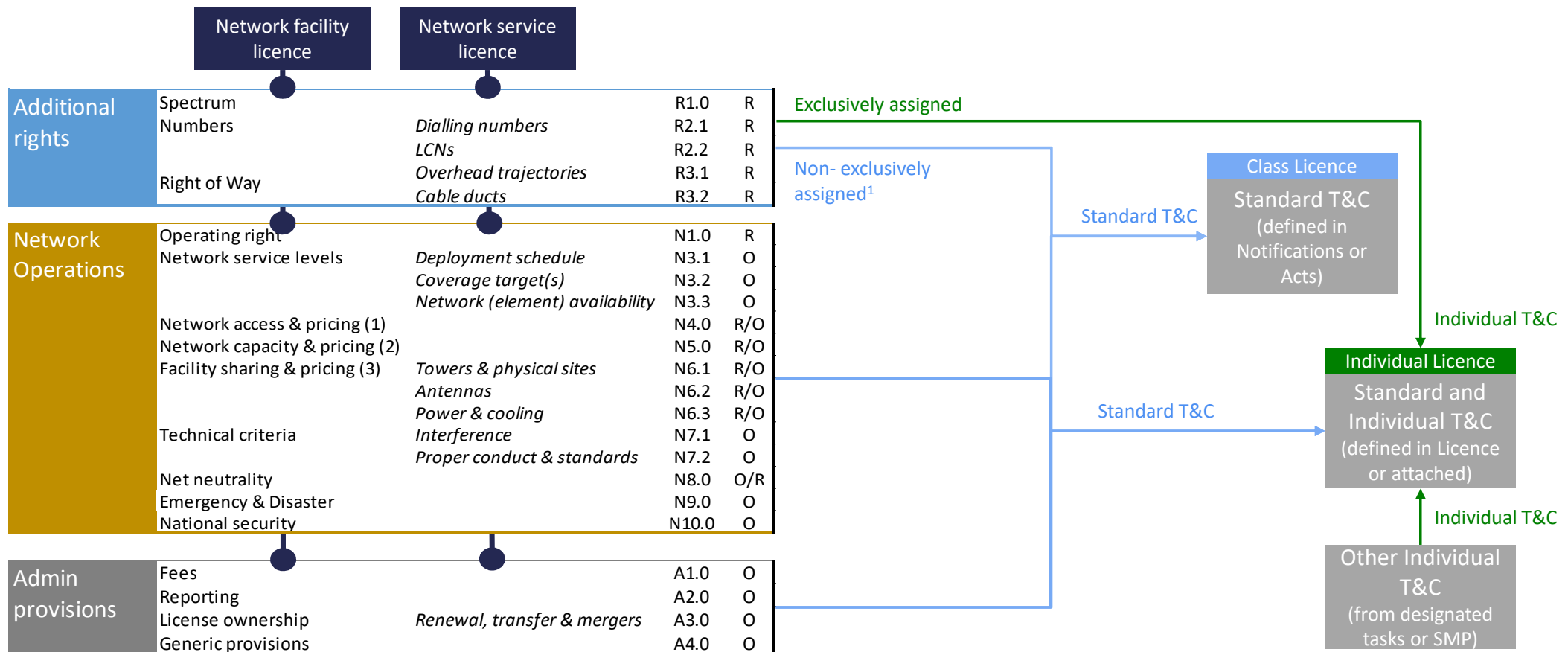
R = Right, O = Obligation

	Application service licence	Content service licence		
Service provisioning	Service right		S1.0	R
	QoS	<i>Service availability</i>	S2.1	O
		<i>Technical quality</i>	S2.2	O
	Consumer pricing	<i>Price cap regulation</i>	S3.0	O
	Consumer Information		S4.0	O
	Consumer choice	<i>Number portability</i>	S5.0	O
	Data privacy		S6.0	O
	Emergency & Disaster		S7.0	O
	National security		S8.0	O
Content provisioning	Content right		C1.0	R
	Editorial		C2.0	O
	Advertising		C3.0	R/O
	Proper content		C4.0	O
	IPR		C5.0	O
Admin provisions	Fees		A1.0	O
	Reporting		A2.0	O
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O
	Generic provisions		A4.0	O



- Method
- Examples

Step 3 – Standard T&C for both licence Types



(1) Excepting Numbers



- Method
- Examples

Step 3 – Example 1 - Backbone network

2. Connectivity
& distribution

Backbone (IP)
network

Individual

Network facility
licence

Network service
licence

Application
service licence

Content service
licence

Additional rights	Spectrum		R1.0	R	
	Numbers	<i>Dialling numbers</i>	R2.1	R	
		<i>LCNs</i>	R2.2	R	
	Right of Way	<i>Overhead trajectories</i>	R3.1	R	√
		<i>Cable ducts</i>	R3.2	R	√
Network Operations	Operating right		N1.0	R	√
	Network service levels	<i>Deployment schedule</i>	N3.1	O	√
		<i>Coverage target(s)</i>	N3.2	O	√
		<i>Network (element) availability</i>	N3.3	O	√ ¹
	Network access & pricing (1)		N4.0	R/O	√ ¹
	Network capacity & pricing (2)		N5.0	R/O	√
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O	
		<i>Antennas</i>	N6.2	R/O	
		<i>Power & cooling</i>	N6.3	R/O	
	Technical criteria	<i>Interference</i>	N7.1	O	
		<i>Proper conduct & standards</i>	N7.2	O	√
	Net neutrality		N8.0	O/R	
Admin provisions	Emergency & Disaster		N9.0	O	
	National security		N10.0	O	√
	Fees		A1.0	O	√
	Reporting		A2.0	O	√ ¹
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O	√
	Generic provisions		A4.0	O	√

- (1) For SMP companies SMP conditions apply
(2) See other examples in Annexes

√ = Standard T&C
√ = Individual T&C
√ = Standard T&C more relevant due to convergence in Thailand

RM	Examples
5	1
SMP	2
YES	B ²
	C ²

Step 3 – Example ② - Fixed ISP



- Method
- Examples

2. Connectivity
& distribution

3. Service
provisioning

Incumbent fixed ISP (Internet access)

Network facility
licence

Individual

Network service
licence

Application
service licence

Content service
licence

Additional rights	Spectrum		R1.0	R	
	Numbers	<i>Dialling numbers</i>	R2.1	R	
		<i>LCNs</i>	R2.2	R	
	Right of Way	<i>Overhead trajectories</i>	R3.1	R	√
		<i>Cable ducts</i>	R3.2	R	√
Network Operations	Operating right		N1.0	R	√
	Network service levels	<i>Deployment schedule</i>	N3.1	O	√
		<i>Coverage target(s)</i>	N3.2	O	√
		<i>Network (element) availability</i>	N3.3	O	√
	Network access & pricing (1)		N4.0	R/O	√ ¹
	Network capacity & pricing (2)		N5.0	R/O	√
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O	
		<i>Antennas</i>	N6.2	R/O	
		<i>Power & cooling</i>	N6.3	R/O	
	Technical criteria	<i>Interference</i>	N7.1	O	
Admin provisions	Net neutrality	<i>Proper conduct & standards</i>	N7.2	O	√
	Emergency & Disaster		N8.0	O/R	√
	National security		N9.0	O	√
	Fees		N10.0	O	√
	Reporting		A1.0	O	√
	License ownership	<i>Renewal, transfer & mergers</i>	A2.0	O	√ ¹
	Generic provisions		A3.0	O	√
			A4.0	O	√

- (1) For SMP companies SMP conditions apply
(2) See other examples in Annexes

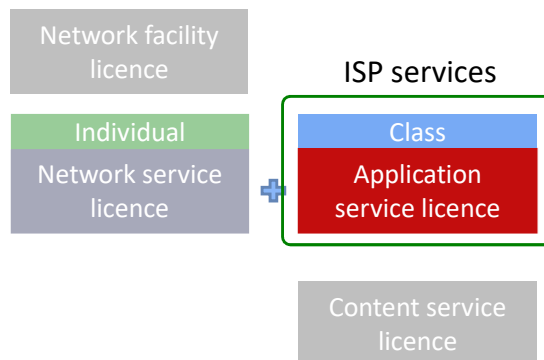
√ = Standard T&C
√ = Individual T&C
√ = Standard T&C more relevant due to convergence in Thailand

RM	Examples
5	①
SMP	②
YES	B ²
	C ²

Step 3 – Example ② - Fixed ISP



- Method
- Examples



Service provisioning	Service right		S1.0	R	✓
	QoS		S2.1	O	✓
		Service availability	S2.2	O	✓
		Technical quality	S2.2	O	✓
	Consumer pricing		S3.0	O	✓ ¹
	Consumer Information		S4.0	O	✓
	Consumer choice		S5.0	O	✓
	Data privacy		S6.0	O	✓
	Emergency & Disaster		S7.0	O	✓
	National security		S8.0	O	✓
Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

- (1) For SMP companies SMP conditions apply
 (2) See other examples in Annexes

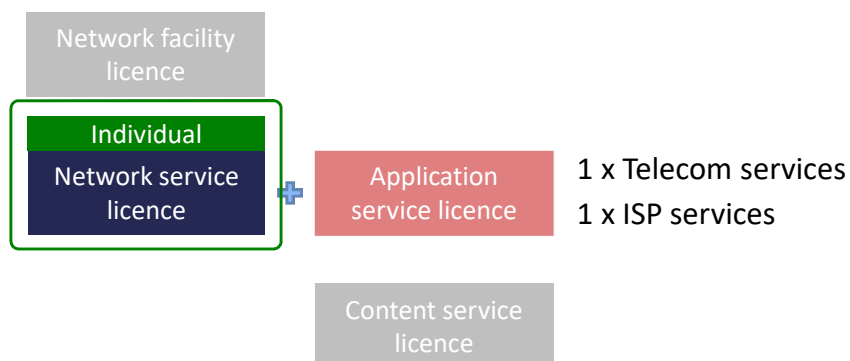
RM	Examples
4	②
SMP	③
YES	B ²

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand

Step 3 – Example ③ - Mobile telecom & internet



- Method
- Examples



Additional rights	Spectrum		R1.0	R	✓
	Numbers	<i>Dialling numbers</i>	R2.1	R	✓
		<i>LCNs</i>	R2.2	R	
	Right of Way	<i>Overhead trajectories</i>	R3.1	R	
		<i>Cable ducts</i>	R3.2	R	
Network Operations	Operating right		N1.0	R	✓
	Network service levels	<i>Deployment schedule</i>	N3.1	O	✓
		<i>Coverage target(s)</i>	N3.2	O	✓
		<i>Network (element) availability</i>	N3.3	O	✓ ¹
	Network access & pricing (1)		N4.0	R/O	✓ ¹
	Network capacity & pricing (2)		N5.0	R/O	✓
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O	✓
		<i>Antennas</i>	N6.2	R/O	
		<i>Power & cooling</i>	N6.3	R/O	
	Technical criteria	<i>Interference</i>	N7.1	O	✓
		<i>Proper conduct & standards</i>	N7.2	O	✓
	Net neutrality		N8.0	O/R	✓
Admin provisions	Emergency & Disaster		N9.0	O	✓
	National security		N10.0	O	✓
	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O	✓
	Generic provisions		A4.0	O	✓

(1) For SMP companies SMP conditions apply

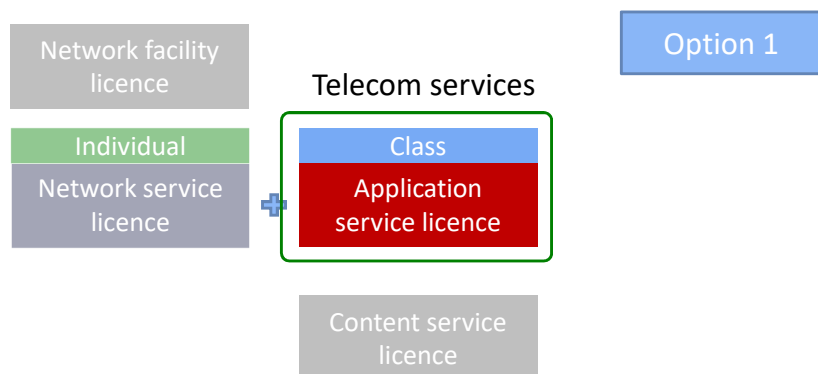
- ✓ = Standard T&C
- ✓ = Individual T&C
- ✓ = Standard T&C more relevant due to convergence in Thailand

RM	Examples
2	③
SMP	
YES	

Step 3 – Example ③ - Mobile telecom & internet



- Method
- Examples

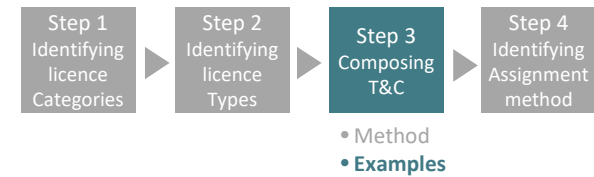


Service provisioning	Service right		S1.0	R	✓
	QoS	Service availability	S2.1	O	✓
		Technical quality	S2.2	O	
	Consumer pricing	Price cap regulation	S3.0	O	1
	Consumer Information		S4.0	O	✓
	Consumer choice	Number portability, no exit charge.	S5.0	O	✓
	Data privacy		S6.0	O	✓
	Emergency & Disaster		S7.0	O	✓
	National security		S8.0	O	✓
Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

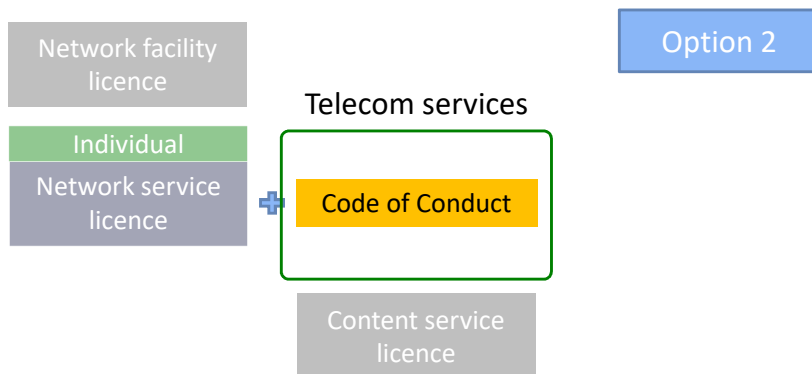
(1) For SMP companies SMP conditions apply

RM	Examples
1	3
SMP	4
YES	

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand



Step 3 – Example 3 - Mobile telecom & internet



- Registration
- Code of Conduct (for Telecom services)

RM	Examples
1	3
SMP	4
NO	

Step 3 – Example ③ - Mobile telecom & internet



- Method
- Examples

2. Connectivity
& distribution

3. Service
provisioning

4. User
interfacing &
reception

Incumbent mobile telecom SP (telecom & Internet access service)

Network facility
licence

ISP services

Individual

Network service
licence



Class

Application
service licence

Content service
licence

Service provisioning	Service right		S1.0	R	✓
	QoS	Service availability	S2.1	O	✓
		Technical quality	S2.2	O	✓
	Consumer pricing	Price cap regulation	S3.0	O	✓ ¹
	Consumer Information		S4.0	O	✓
	Consumer choice	Number portability, no exit charge:	S5.0	O	✓
	Data privacy		S6.0	O	✓
	Emergency & Disaster		S7.0	O	✓
	National security		S8.0	O	✓

Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

- (1) For SMP companies SMP conditions apply
(2) See other examples in Annexes

RM	Examples
4	②
SMP	③
YES	B ²

✓ = Standard T&C
✓ = Individual T&C
✓ = Standard T&C more relevant due to convergence in Thailand

Step 3 – Example 4 - OTT telecom



- Method
- Examples

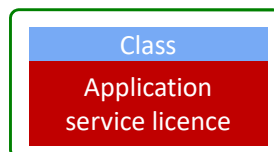


Option 1

Network facility
licence

Network service
licence

Telecom services



Content service
licence

Service provisioning	Service right		S1.0	R	✓
	QoS	Service availability	S2.1	O	✓
		Technical quality	S2.2	O	
	Consumer pricing	Price cap regulation	S3.0	O	1
	Consumer Information		S4.0	O	✓
	Consumer choice	Number portability, no exit charge.	S5.0	O	✓
	Data privacy		S6.0	O	✓
	Emergency & Disaster		S7.0	O	✓
	National security		S8.0	O	✓
Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

(1) For SMP companies SMP conditions apply

RM	Examples
1	3
SMP	4
YES	

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand

Step 3 – Example 4 - OTT telecom

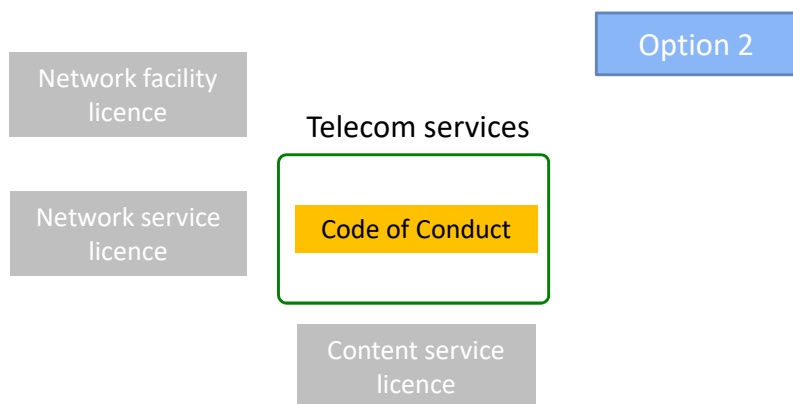


- Method
- Examples



- Registration
- Code of Conduct (for Telecom services)

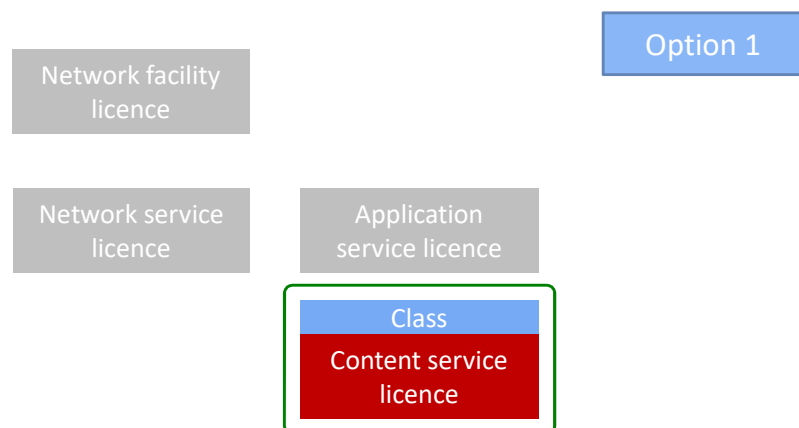
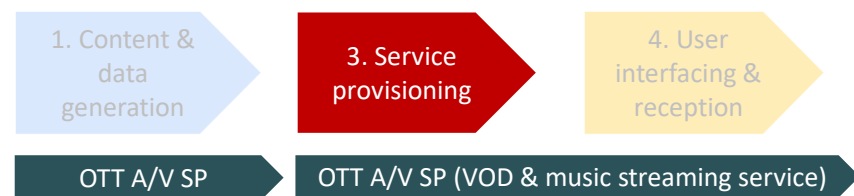
RM	Examples
1	3
SMP	4
NO	



Step 3 – Example 5 - OTT A/V



- Method
- Examples



A/V services

Content provisioning	Content right	C1.0	R	✓
	Editorial	C2.0	O	
	Advertising	C3.0	R/O	
	Proper content	C4.0	O	✓
	IPR	C5.0	O	✓

Service provisioning	Service right	S1.0	R	✓
	QoS	S2.1	O	
	<i>Service availability</i>	S2.2	O	
	<i>Technical quality</i>	S3.0	O	
	Consumer pricing	S4.0	O	✓
	Consumer information	S5.0	O	✓
	Consumer choice	S6.0	O	✓
	<i>Price cap regulation</i>	S7.0	O	✓
	<i>Number portability, no exit charge.</i>	S8.0	O	

Admin provisions	Fees	A1.0	O	✓
	Reporting	A2.0	O	✓
	License ownership	A3.0	O	✓
	Generic provisions	A4.0	O	✓

(1) See other examples in Annexes

- ✓ = Standard T&C
- ✓ = Individual T&C
- ✓ = Standard T&C more relevant due to convergence in Thailand

RM	Examples
T.B.D	5
SMP	C ¹
YES	D ¹

Step 3 – Example 5 - OTT A/V

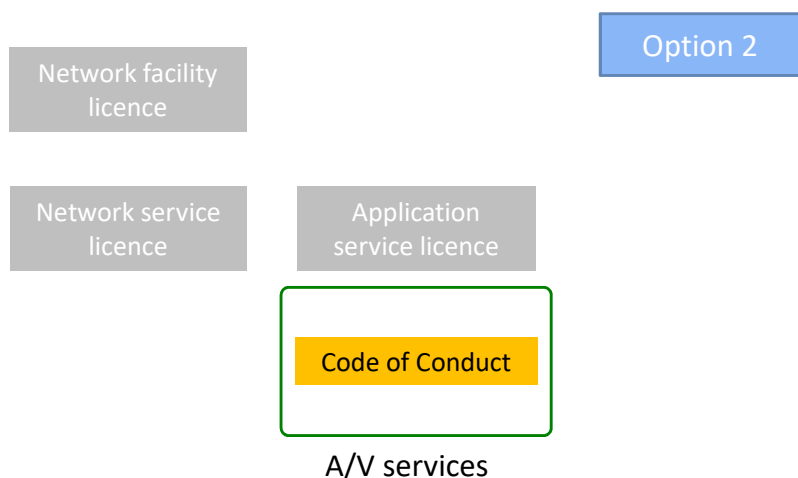


- Method
- Examples



- Registration
- Code of Conduct (for A/V services)

RM	Examples
T.B.D	5
SMP	C ¹
NO	D ¹

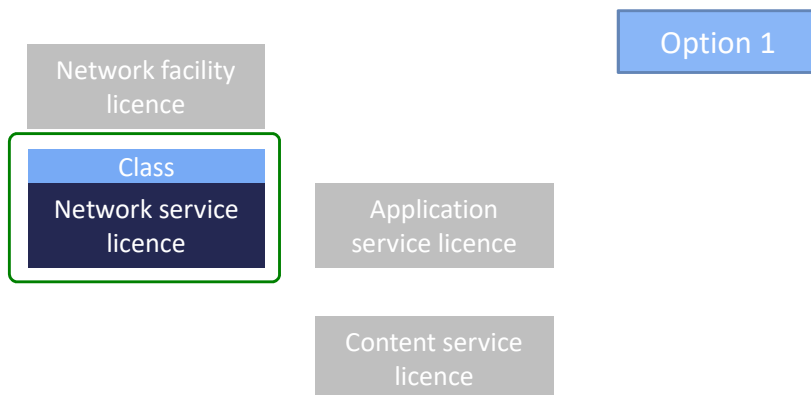
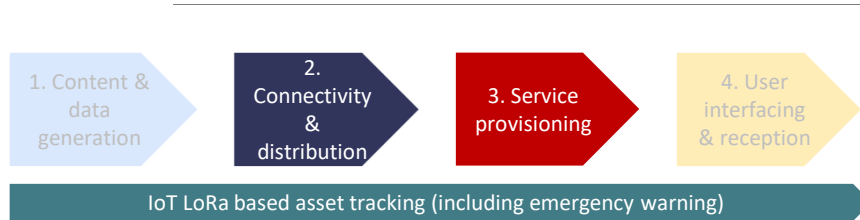


(1) See other examples in Annexes



- Method
- Examples

Step 3 – Example ⑥ - IoT LoRa based asset tracking



Additional rights	Spectrum Numbers		R1.0	R	
	<i>Dialling numbers</i>		R2.1	R	
	<i>LCNs</i>		R2.2	R	
	<i>Overhead trajectories</i>		R3.1	R	
Network Operations	Right of Way		R3.2	R	
	Operating right		N1.0	R	✓
	Network service levels	<i>Deployment schedule</i>	N3.1	O	✓
		<i>Coverage target(s)</i>	N3.2	O	✓
		<i>Network (element) availability</i>	N3.3	O	✓
	Network access & pricing (1)		N4.0	R/O	
	Network capacity & pricing (2)		N5.0	R/O	
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O	
		<i>Antennas</i>	N6.2	R/O	
		<i>Power & cooling</i>	N6.3	R/O	
	Technical criteria	<i>Interference</i>	N7.1	O	✓
		<i>Proper conduct & standards</i>	N7.2	O	✓
	Net neutrality		N8.0	O/R	
	Emergency & Disaster		N9.0	O	✓
	National security		N10.0	O	
Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O	✓
	Generic provisions		A4.0	O	✓

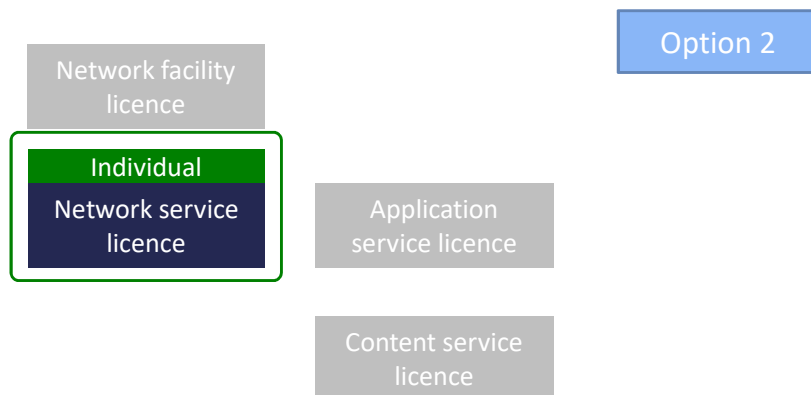
✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand

RM	Examples
T.B.D	⑥
SMP	
NO	



- Method
- Examples

Step 3 – Example 6 - IoT LoRa based asset tracking



Additional rights	Spectrum Numbers		R1.0	R	✓
		<i>Dialling numbers</i>	R2.1	R	✓
		<i>LCNs</i>	R2.2	R	
	Right of Way	<i>Overhead trajectories</i>	R3.1	R	
Network Operations		<i>Cable ducts</i>	R3.2	R	
	Operating right		N1.0	R	✓
	Network service levels	<i>Deployment schedule</i>	N3.1	O	✓
		<i>Coverage target(s)</i>	N3.2	O	✓
		<i>Network (element) availability</i>	N3.3	O	✓
	Network access & pricing (1)		N4.0	R/O	
	Network capacity & pricing (2)		N5.0	R/O	
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O	
		<i>Antennas</i>	N6.2	R/O	
		<i>Power & cooling</i>	N6.3	R/O	
	Technical criteria	<i>Interference</i>	N7.1	O	✓
		<i>Proper conduct & standards</i>	N7.2	O	✓
Admin provisions	Net neutrality		N8.0	O/R	
	Emergency & Disaster		N9.0	O	✓
	National security		N10.0	O	
	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O	✓
	Generic provisions		A4.0	O	✓

RM	Examples
T.B.D	6
SMP	
NO	

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand

Step 3 – Example 6 - IoT LoRa based asset tracking

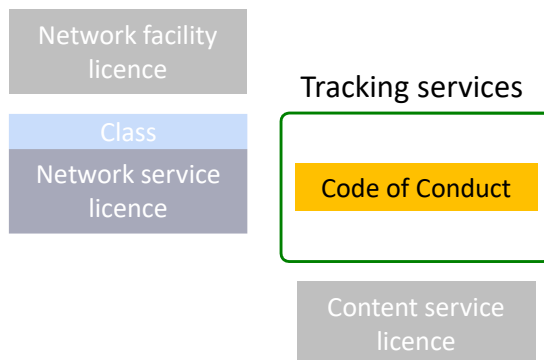


- Method
- Examples



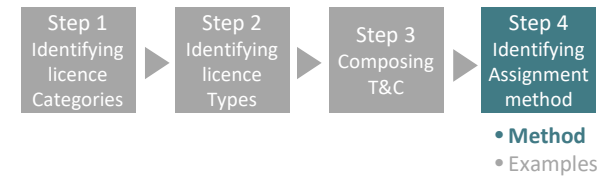
- Registration
- Code of Conduct (for tracking services)

RM	Examples
T.B.D	6
SMP	
NO	





Step 4: Identifying assignment method



Step 4 - Licence assignment and T&C

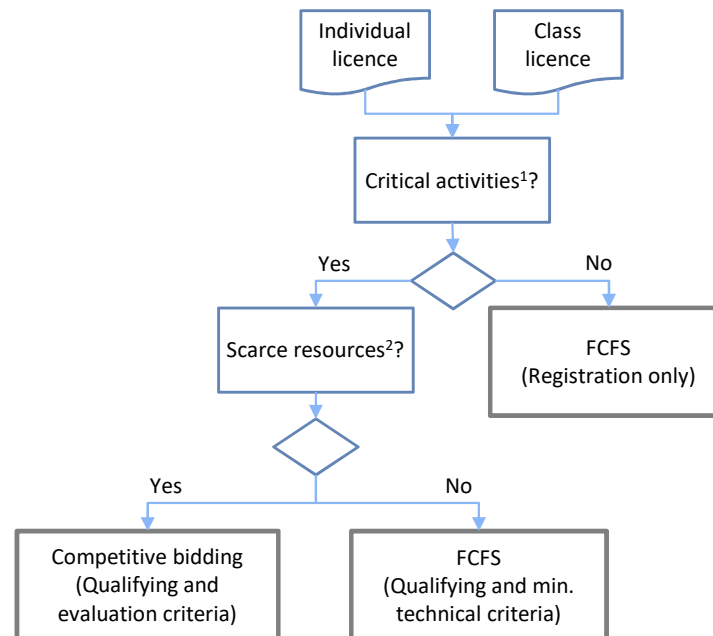
Assignment methods		1. Applicant's qualifications examined/tested?	1. Results of test attached/included in Licence?	2. Applicant's activities or offering examined/tested?	2. Results of test attached/included in Licence?	
	Competitive bidding (Qualifying and evaluation criteria)	✓	X	✓	✓ (Public tender only)	For example Applicant's bid book
	FCFS (Qualifying and min. technical criteria)	✓	X	✓	✓	For example EMC measurement results
	FCFS (Registration only)	X	X	X	X	Critical Activities cannot be assigned by means of Registration only

Code of Conduct /Self-regulation

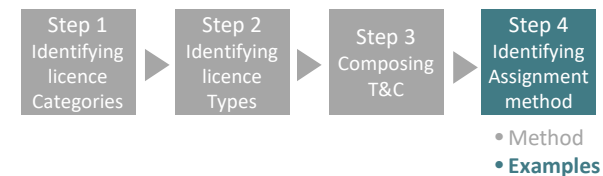
Note: Any licensee has to comply with the Qualification criteria as stipulated in Act/Notifications, at all times

Step 4 - Overview of identifying assignment method

- (1) Activities are critical if they have a significant impact on the General Public
Impact on the General Public is only considered low if:
- Activity is carried out for a limited user group to meet specific requirements (includes closed user group), and
 - For a specific and limited purpose
- OR
- Degree of reliance by the General Public on the activity is low, and
 - Degree of reliance of other downstream providers is low
- (2) Resources (Spectrum, Numbers, RoW) that have more demand than available supply, at a given time



Step 4 – Example 1 - Backbone network



2. Connectivity
& distribution

Backbone (IP)
network

Individual

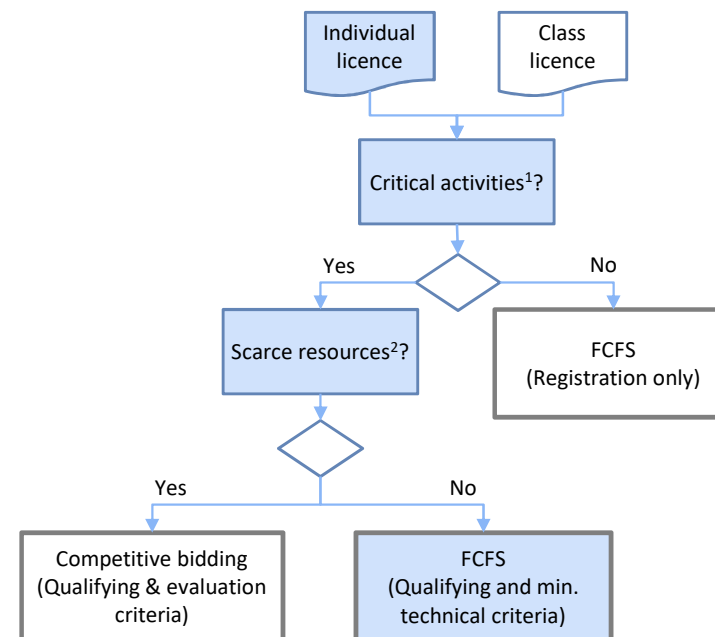
Network facility
licence

FCFS + Q&T criteria

Network service
licence

Application
service licence

Content service
licence



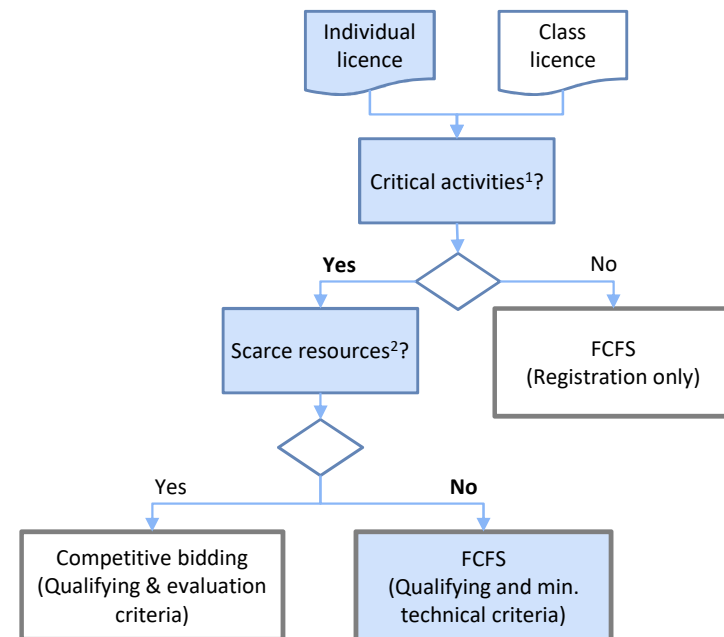
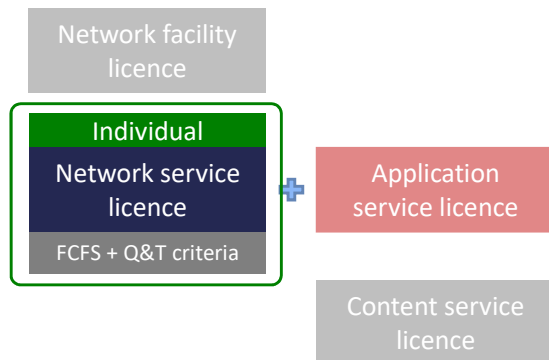
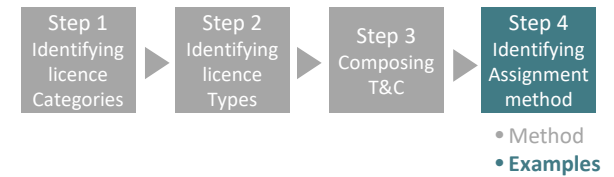
RM

5

SMPs

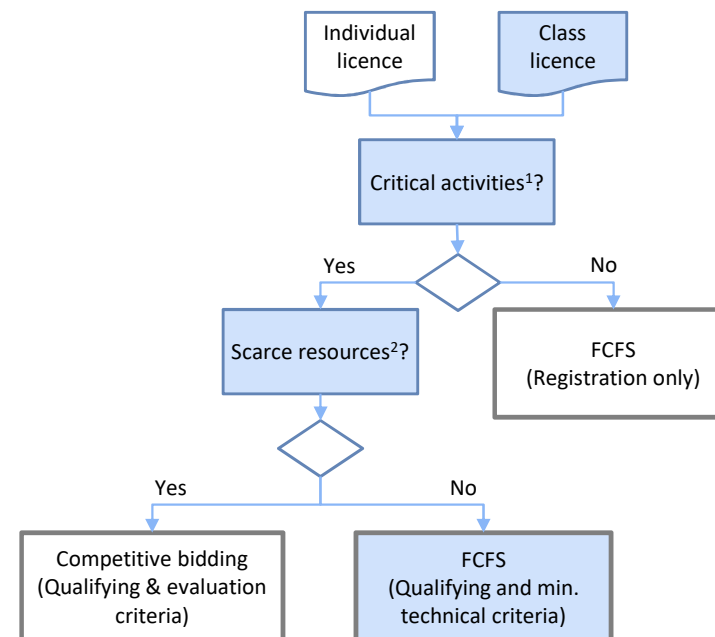
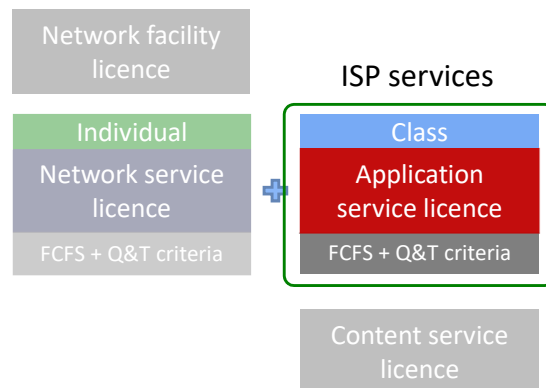
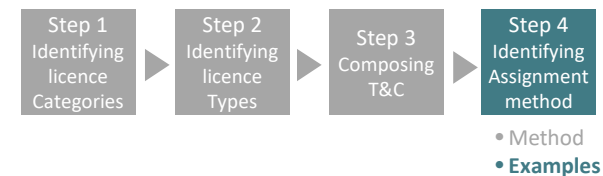
YES

Step 4 – Example 2 - Fixed ISP



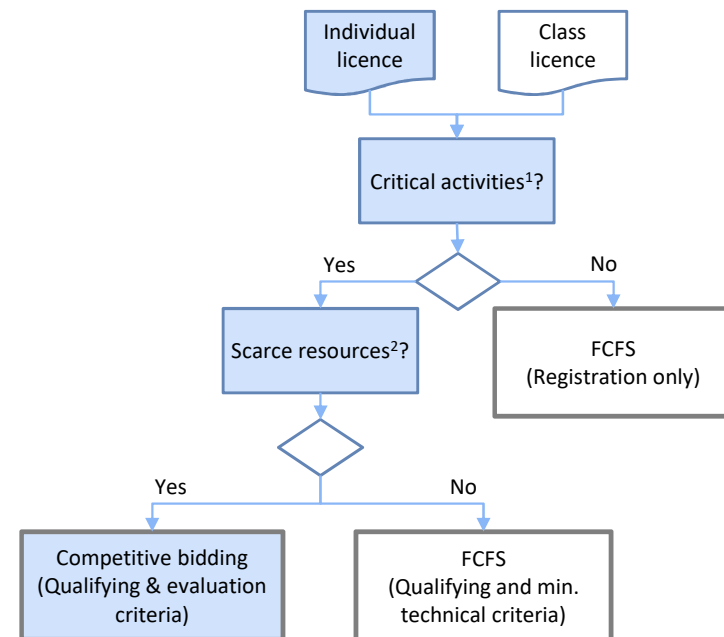
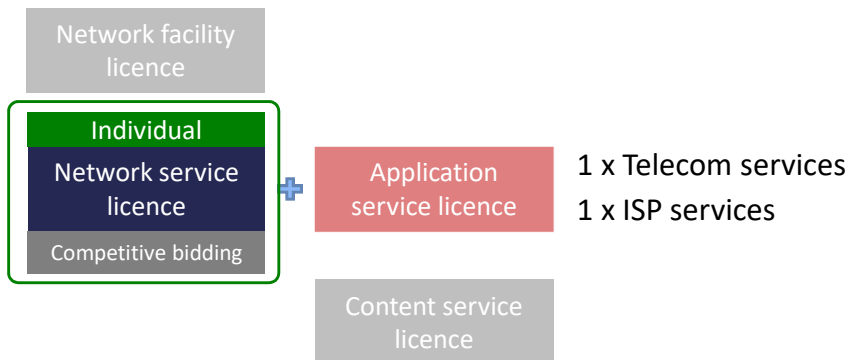
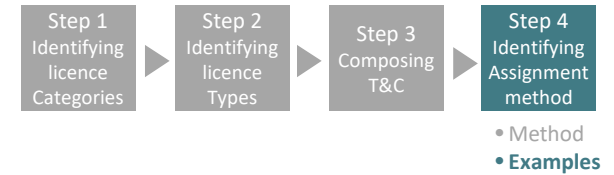
RM
5
SMPs
YES

Step 4 – Example 2 - Fixed ISP

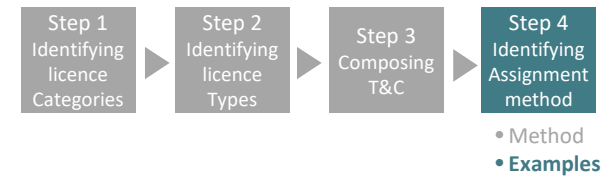


RM
4
SMPs
YES

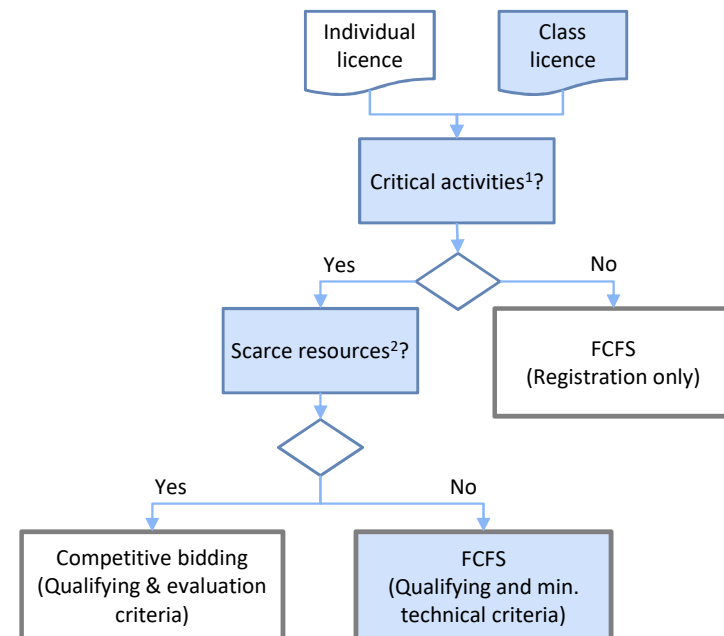
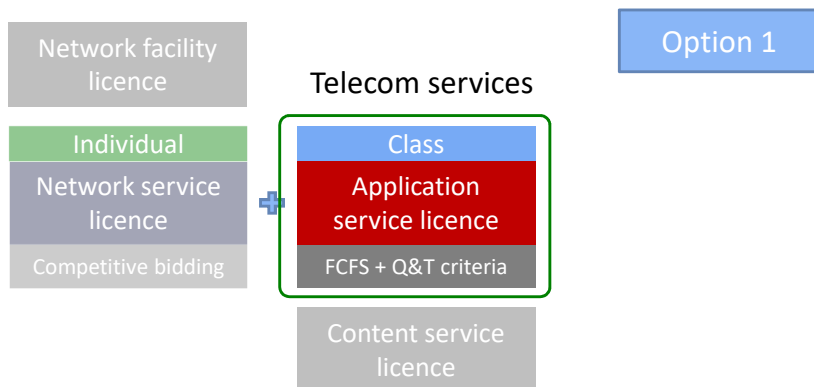
Step 4 – Example ③ - Mobile telecom & internet



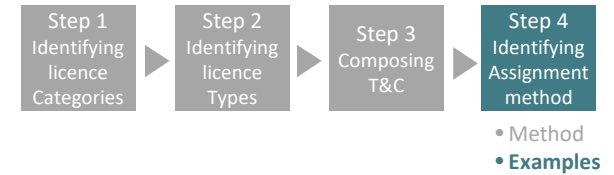
RM
2
SMPs
YES



Step 4 – Example ③ - Mobile telecom & internet



RM
1
SMPs
YES

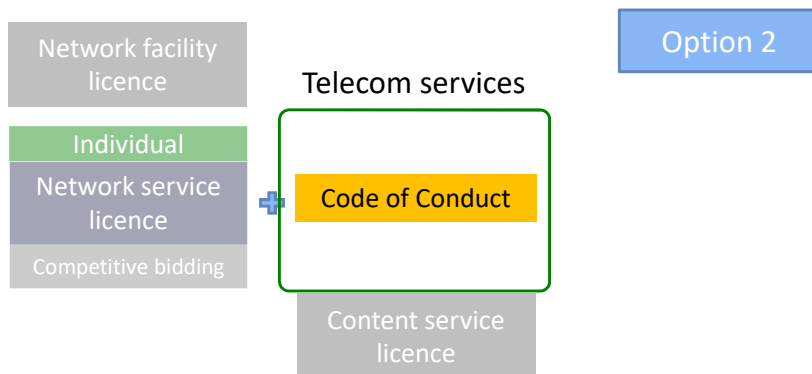


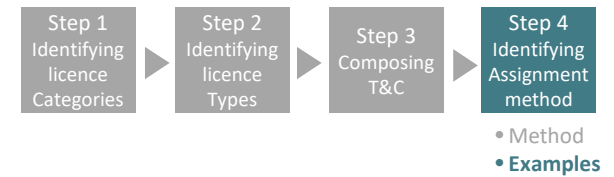
Step 4 – Example ③ - Mobile telecom & internet



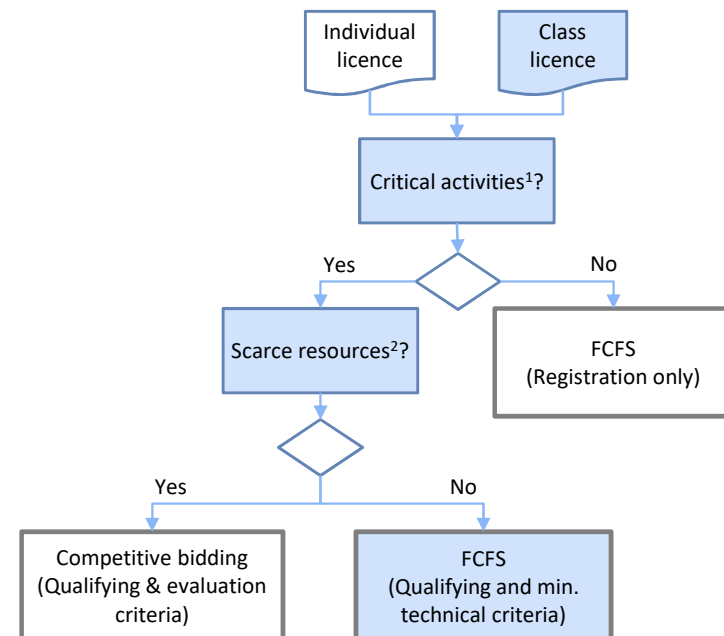
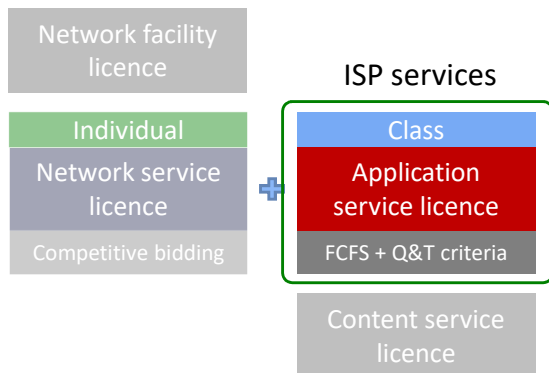
- Code of Code (for Telecom services)
- NA – no licence assignment

RM
1
SMPs
NO



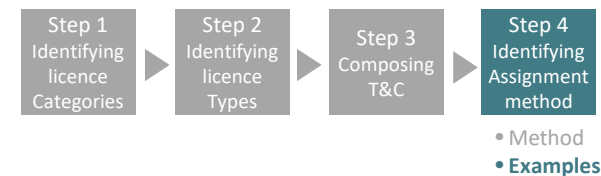


Step 4 – Example ③ - Mobile telecom & internet

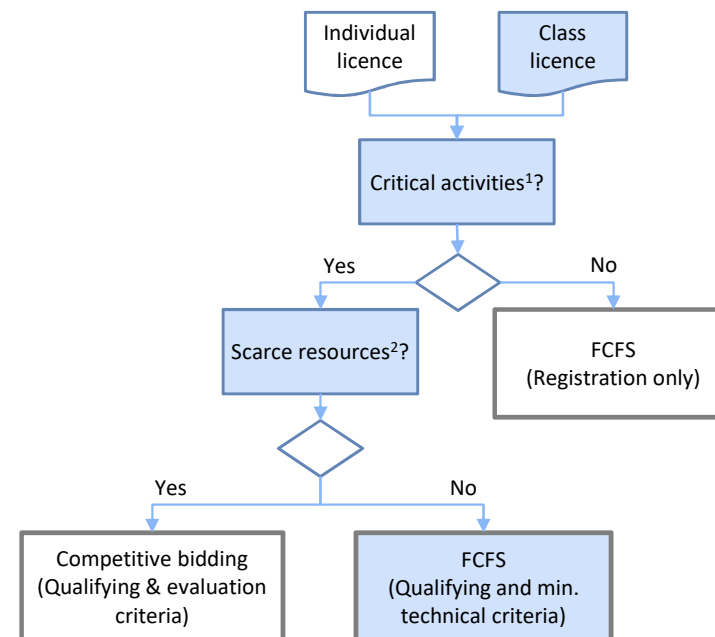
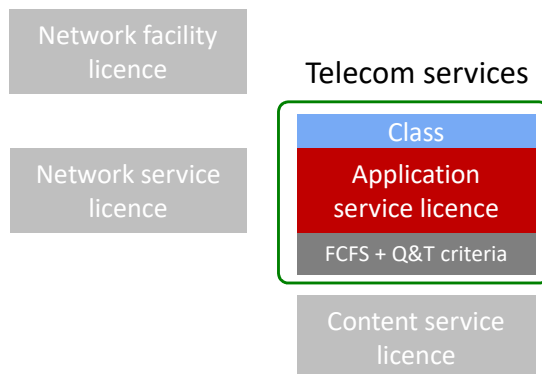


RM
4
SMPs
YES

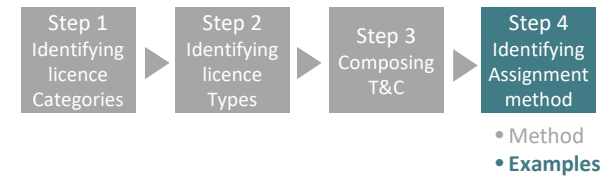
Step 4 – Example 4 - OTT telecom



Option 1



RM
1
SMPs
YES

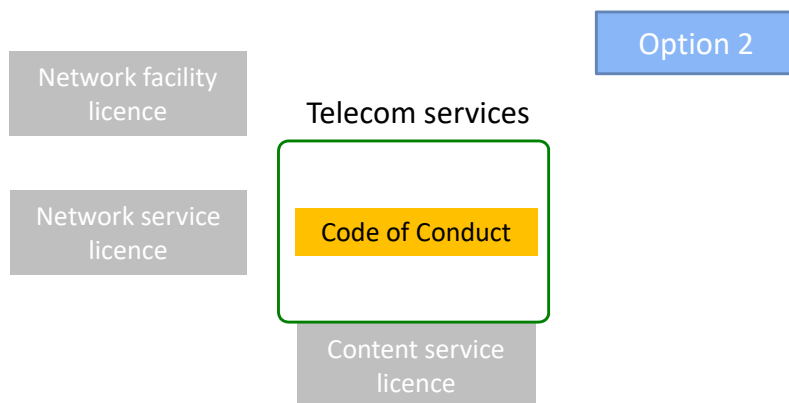


Step 4 – Example 4 - OTT telecom

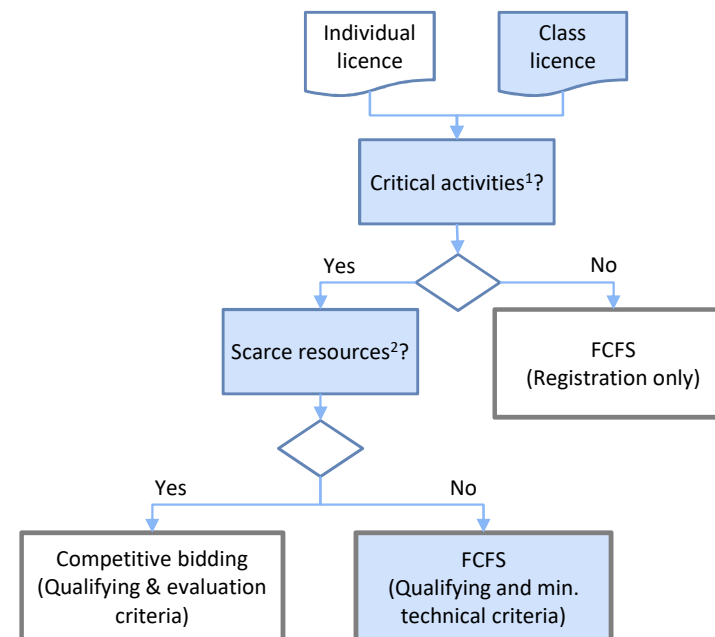
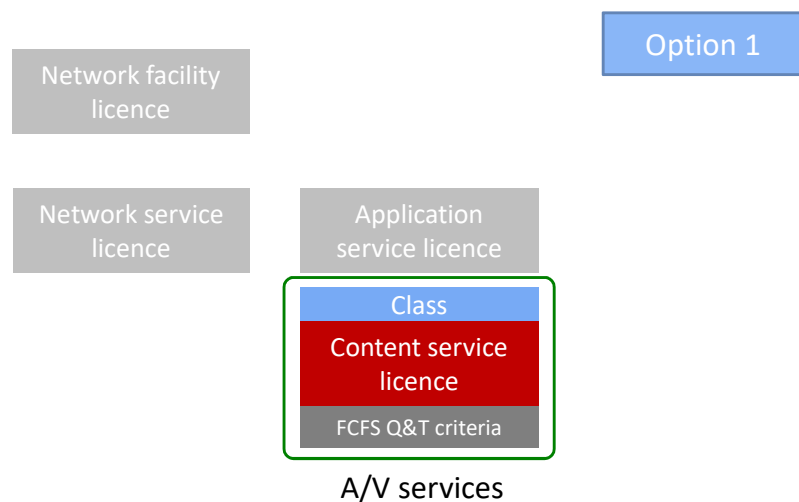
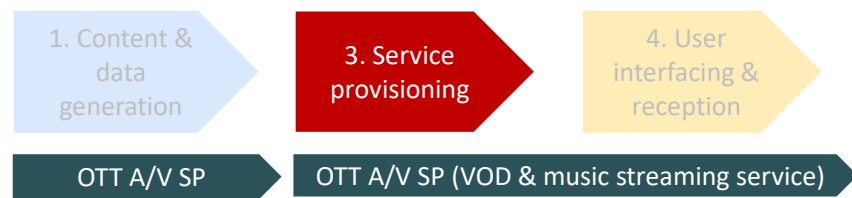
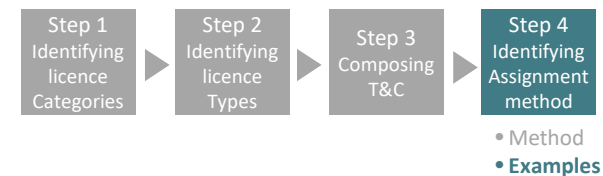


- Code of Code (for Telecom services)
- NA – no licence assignment

RM
1
SMPs
NO

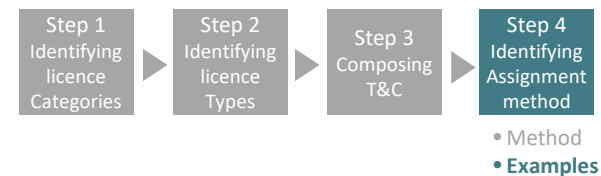


Step 4 – Example 5 - OTT A/V



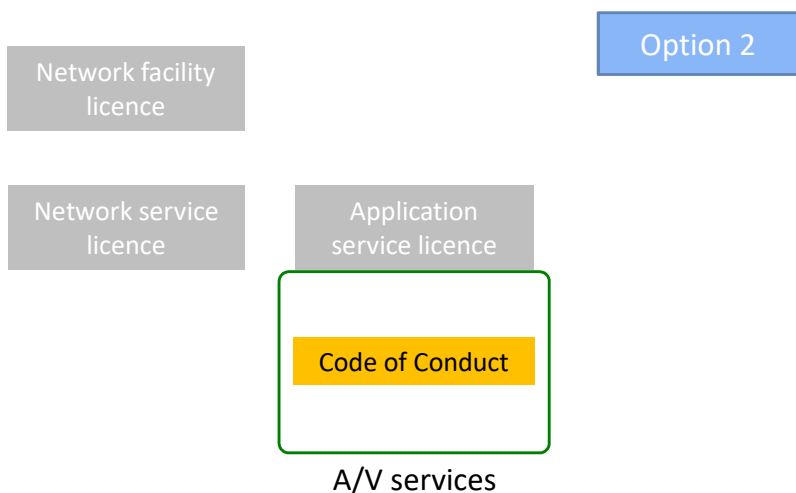
RM
T.B.D.
SMPs
YES

Step 4 – Example 5 - OTT A/V

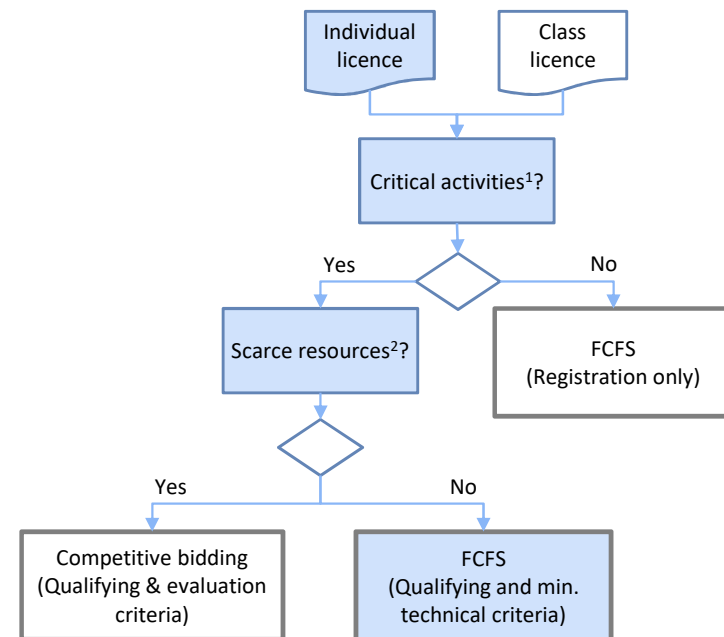
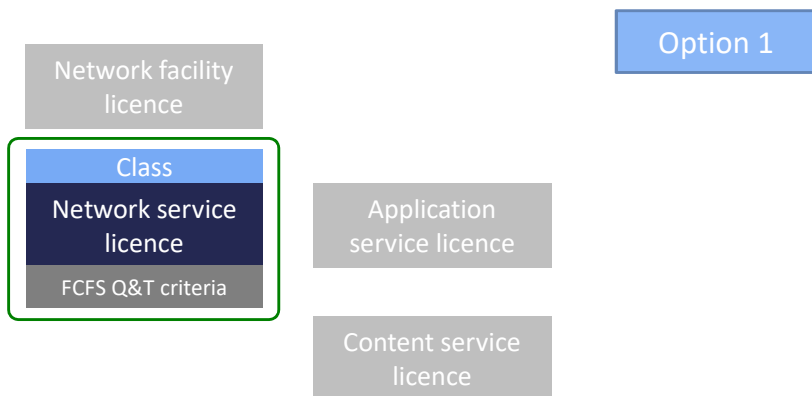
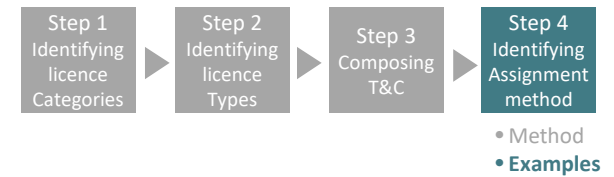


- Code of Code (for A/V services)
- NA – no licence assignment

RM
T.B.D.
SMPs
NO



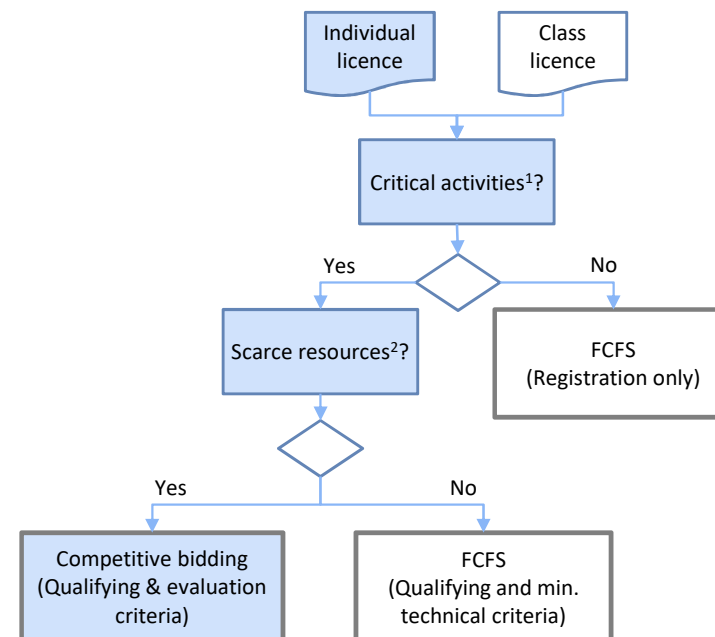
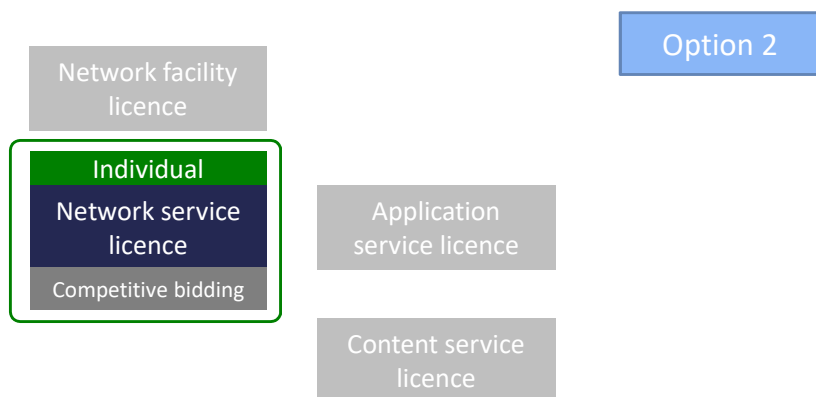
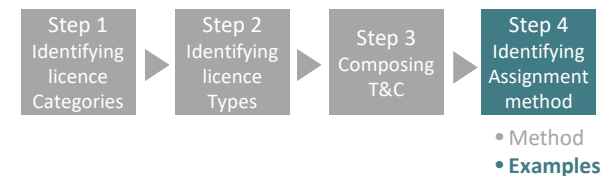
Step 4 – Example ⑥ - IoT LoRa based asset tracking



RM
T.B.D.

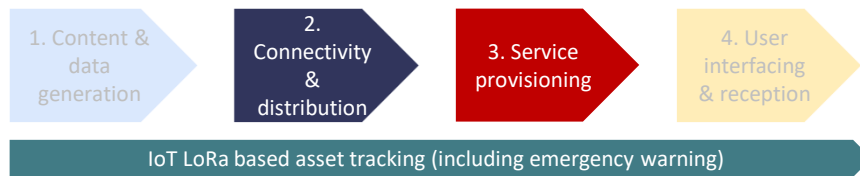
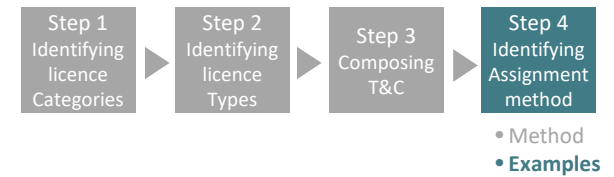
SMPs
NO

Step 4 – Example ⑥ - IoT LoRa based asset tracking



RM
T.B.D.
SMPs
NO

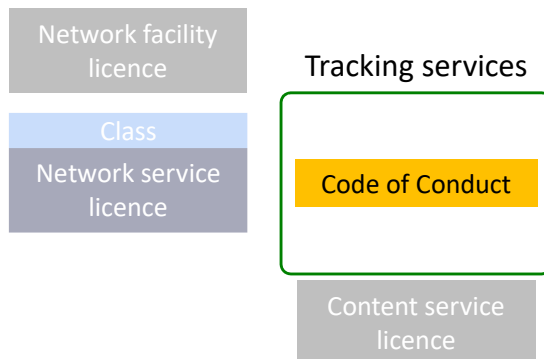
Step 4 – Example ⑥ - IoT LoRa based asset tracking



- Code of Code (for tracking services)
- NA – no licence assignment

RM
T.B.D.

SMPs
NO





Conclusions & Recommendations

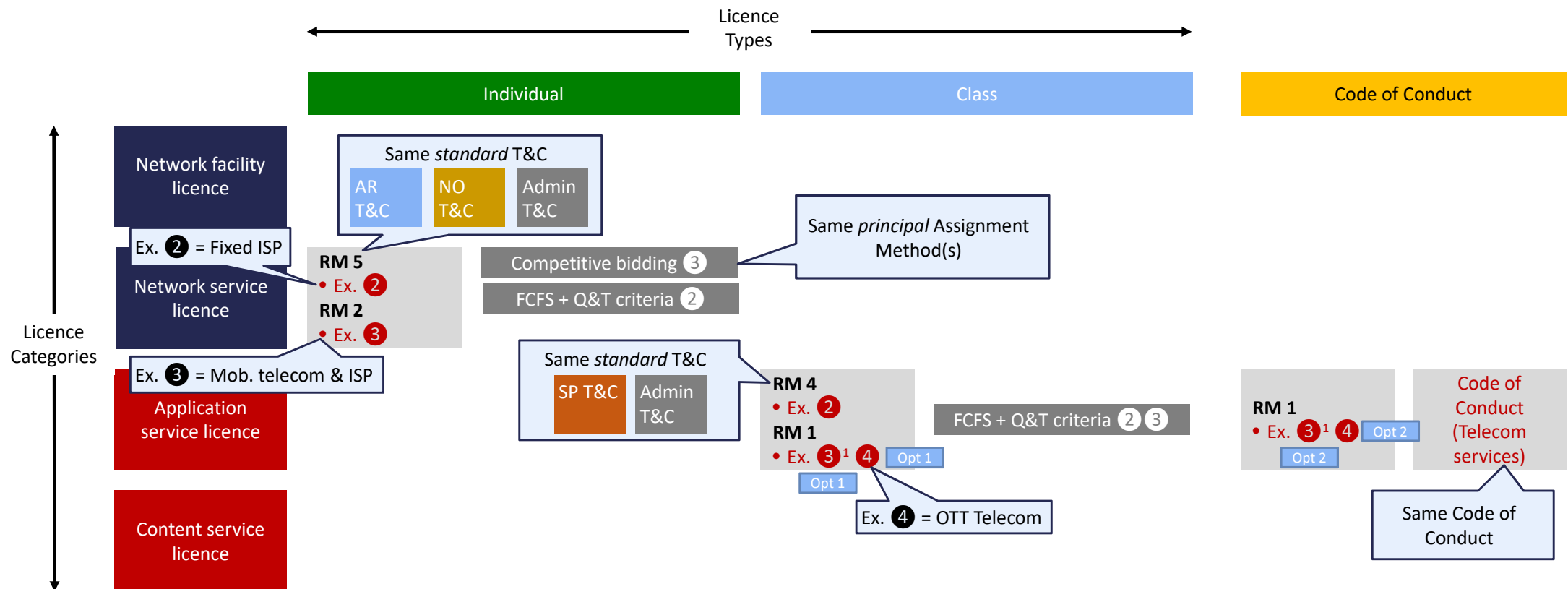
Conclusions: CLF model is comprehensive and flexible

		Licence Types					
		Individual		Class		Code of Conduct	
Licence Categories	Options 1 Only						
	Network facility licence	① Backbone	FCFS + Q&T criteria ①	Type of Activities	Competitive bidding FCFS + Q&T criteria FCFS + registration only	A Telco towers	Code of Conduct
	Network service licence	② FX ISP NO ③ Mob NO B,C,D - FX NO	Competitive bid ③ D FCFS + Q&T criteria ② BC	⑥ IoT NO	FCFS + Q&T criteria ⑥	Type of Activities	Code of Conduct
	Application service licence	Type of Activities	Competitive bidding FCFS + Q&T criteria FCFS + registration only	② ISP SP ③ Mob telco SP ④ OTT telco SP B,C - FX telco SP	FCFS + Q&T criteria ② ③ ④ BC	Type of Activities	Code of Conduct
	Content service licence	Type of Activities	Competitive bidding FCFS + Q&T criteria FCFS + registration only	⑤ OTT A/V SP C - Telco A/V SP D - BC A/V SP	FCFS + Q&T criteria ⑤ C D	Type of Activities	Code of Conduct

Conclusions: CLF model is comprehensive and flexible

Options 2 Only		Licence Types			
Licence Categories		Individual		Class	Code of Conduct
	Network facility licence	1 Backbone FCFS + Q&T criteria 1		Type of Activities Competitive bidding FCFS + Q&T criteria FCFS + registration only	A Telco towers Code of Conduct
	Network service licence	2 FX ISP NO 3 Mob NO 6 IoT NO B,C,D - FX NO Competitive bid 3 6 D FCFS + Q&T criteria 2 BC		Type of Activities Competitive bidding FCFS + Q&T criteria FCFS + registration only	Type of Activities Code of Conduct
	Application service licence	Type of Activities Competitive bidding FCFS + Q&T criteria FCFS + registration only	2 ISP SP	FCFS + Q&T criteria 2	3 Mob telco SP 4 OTT telco SP B,C - FX telco SP Code of Conduct
	Content service licence	Type of Activities Competitive bidding FCFS + Q&T criteria FCFS + registration only	Type of Activities	Competitive bidding FCFS + Q&T criteria FCFS + registration only	5 OTT A/V SP C - Telco A/V SP D - BC A/V SP Code of Conduct

Conclusions: CLF model creates a level playing field in the same RMs



(1) Telecom services only (ISP services not plotted in table)

Conclusions: CLF model creates a level playing field with OTT players

RM 1
• Ex. 3

Example 3 = Mobile telecom & internet

For example as
provided by:



RM 1
• Ex. 4

Example 4 = OTT telecom

For example as
provided by:



Option 1

Telecom services

Class

Application
service licence

FCFS + Q&T criteria

Service provisioning	Service right		\$1.0	R	✓
	QoS		\$2.1	O	✓
		Service availability	\$2.2	O	
		Technical quality	\$3.0	O	1
	Consumer pricing	Price cap regulation	\$4.0	O	✓
	Consumer Information		\$5.0	O	✓
	Consumer choice	Number portability, no exit charge	\$6.0	O	✓
	Data privacy		\$7.0	O	✓
	Emergency & Disaster		\$8.0	O	✓
	National security				✓
Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

Level

Option 1

Telecom services

Class

Application
service licence

FCFS + Q&T criteria

Service provisioning	Service right		\$1.0	R	✓
	QoS		\$2.1	O	✓
		Service availability	\$2.2	O	
		Technical quality	\$3.0	O	1
	Consumer pricing	Price cap regulation	\$4.0	O	✓
	Consumer Information		\$5.0	O	✓
	Consumer choice	Number portability, no exit charge	\$6.0	O	✓
	Data privacy		\$7.0	O	✓
	Emergency & Disaster		\$8.0	O	✓
	National security				✓
Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

Market
distortion

Level

Option 2

Telecom services

Code of Conduct

- Code of Code (for Telecom services)
- NA – no licence assignment

Option 2

Telecom services

Code of Conduct

- Code of Code (for Telecom services)
- NA – no licence assignment

Conclusions: CLF model can cater for technology or market changes

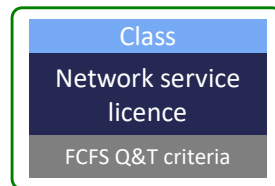
RM 1
• Ex. 6

Example 6 = IoT LoRa based asset tracking

For example as provided by: CAT & SK telecom in Phuket Smart City project

Option 1

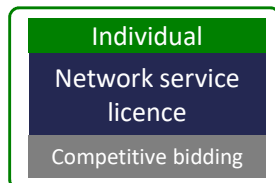
LoRa based asset tracking



- LoRa is LPWA with spread spectrum technology
- LoRa based networks are typically assigned in licence exempt spectrum bands
- Interference between LoRa users is initially assessed to be low due to gradual uptake of IoT (low volumes of M2M traffic)

Option 2

LoRa based asset tracking



- In maturing markets (high volumes of M2M traffic) and critical activities (like M initiated emergency alerts), network availability is key
 - LoRa networks need exclusively assigned spectrum
- OR
- LTE-M or 5G based networks are cellular systems and need exclusively assigned spectrum

Recommendations

- The Key Licensing Principles should be:
 1. In markets considered fully competitive (no SMPs identified), only use basic registrations/self-regulation in ICT licensing, and only assign licences (with special T&C) if:
 - ‘Designated tasks’ are included, OR
 - ‘High risk of conflicts’
 - An exemption may apply for A/V services
 2. If licensing is necessary, only assign an Individual licence if:
 - ‘Designated tasks’ are included, OR
 - ‘High risk of conflicts’, otherwise assign a Class licence
 3. Assign through FCFS Q&T or Competitive bidding , only if assigning ‘critical activities’, otherwise FCFS/Registration only
- Start adopting the four-tier CLF model by:
 - Redefining RMs by:
 - Considering the full scope of the activities in the converged ICT Value Chain, including A/V content
 - Considering Fixed/Mobile convergence
 - Including OTT Telecom, OTT A/V and IoT activities
 - Fill the four-tier CLF model (i.e. the Table) with ICT activities by:
 - Applying the Key Licensing Principles
 - Following the four Steps



Annex A: Details SM and SMP

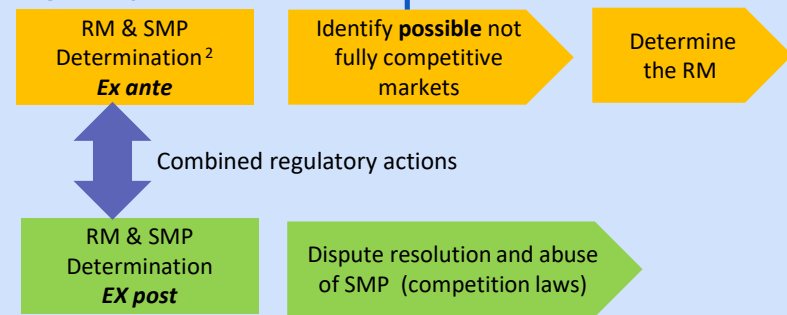
Annex A: First step is defining RM

Criteria for determining ex-ante regulation needed ¹

Regulate if all 3 conditions are expected to be met:

- Existence of any type of high barriers of entry (structural/legal/regulatory)
- Lack of market forces towards future competitive levels
- Insufficient force of competition law

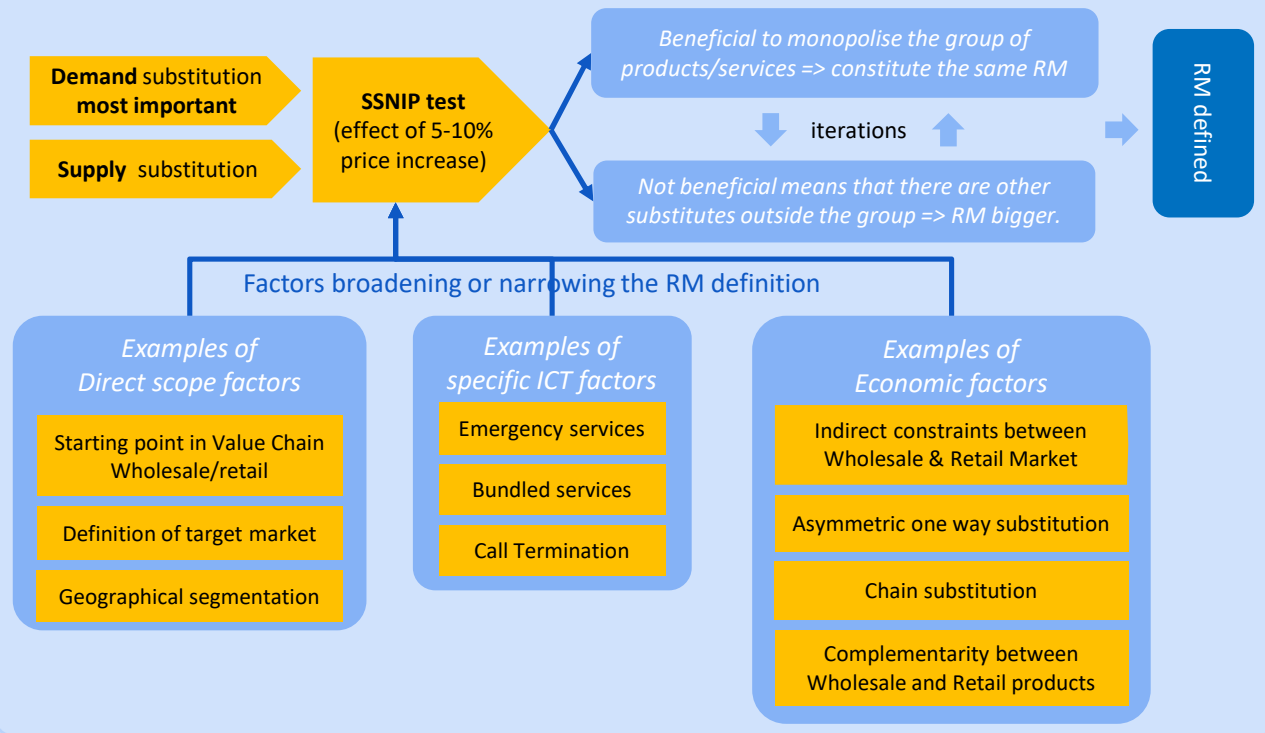
Regulatory tools:



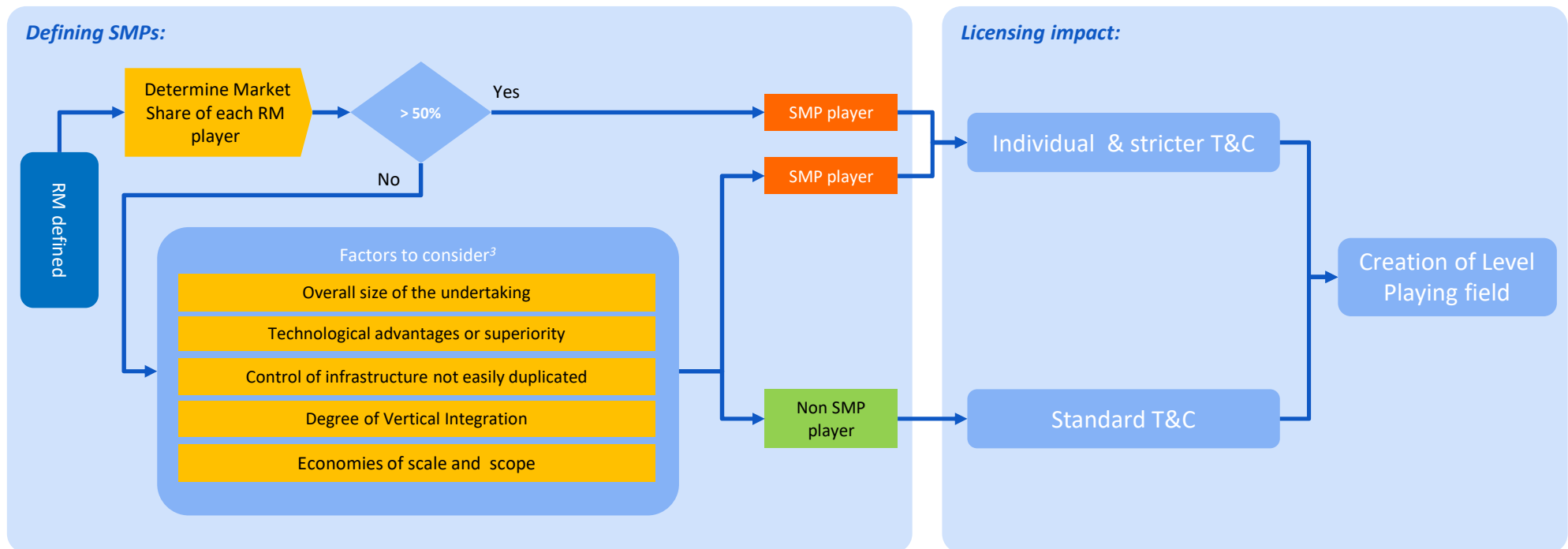
- (1) According to EU recommendation on ex-ante regulation in electronic communication sector, 9th. Oct. 2014
- (2) Herfindahl-Hirschman index (the sum of squared individual markets shares before and after) is used for merger approval.

How: Questionnaire

Objective: Determine the smallest Relevant Market



Annex A: Second step is defining SMPs

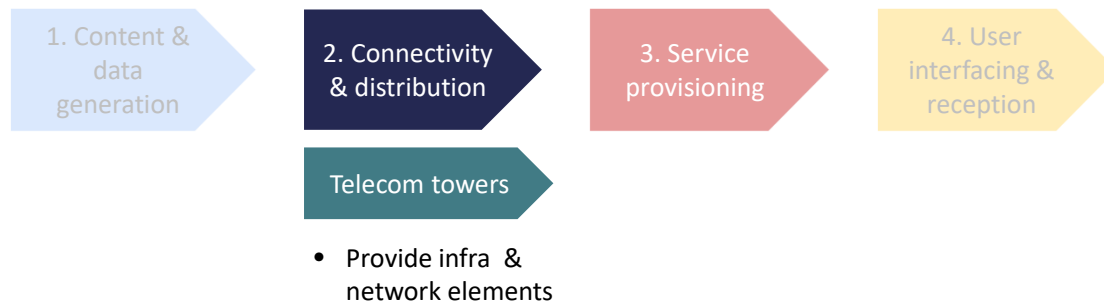
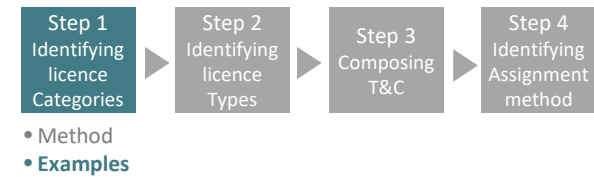


(1) Most commonly used factors

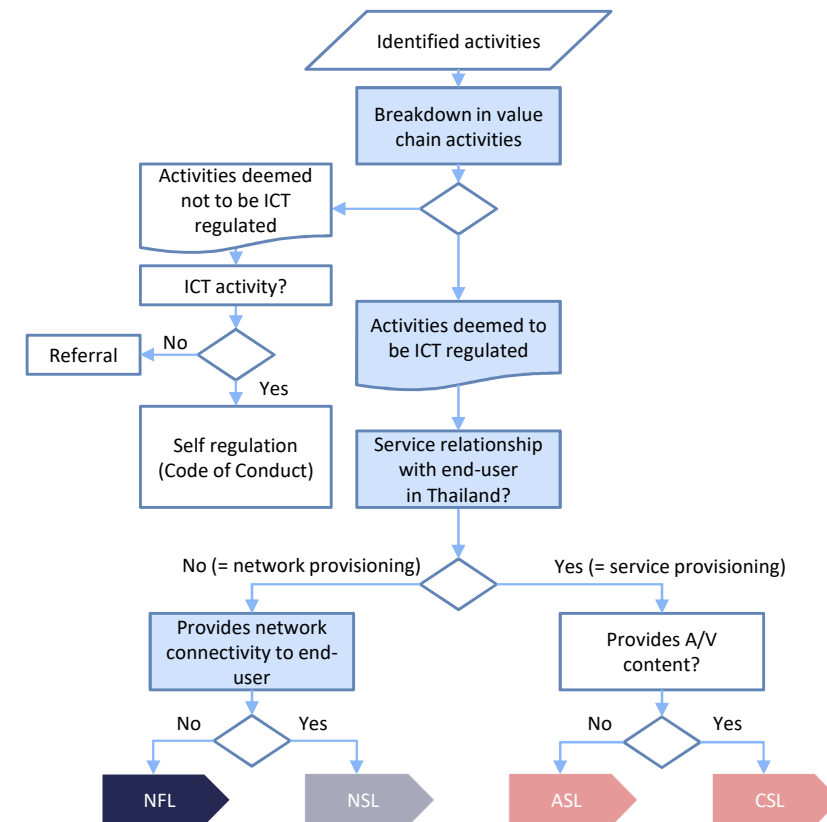
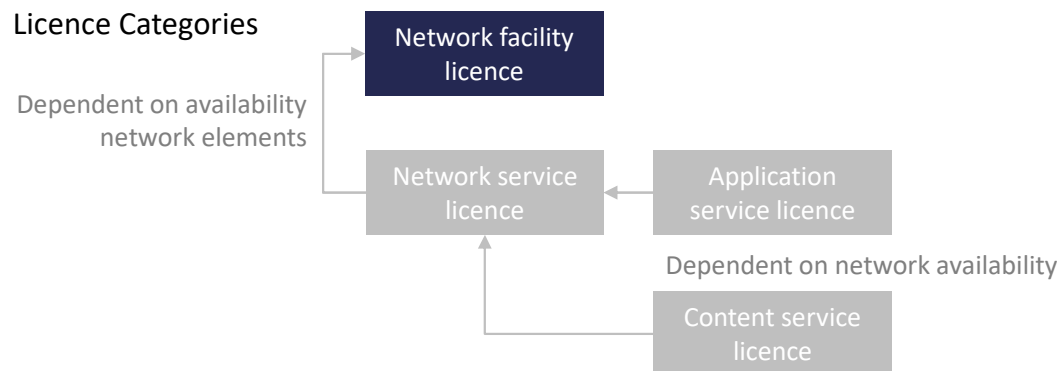


Annex B: More examples Step 1

Step 1 – Example A - Telecom towers



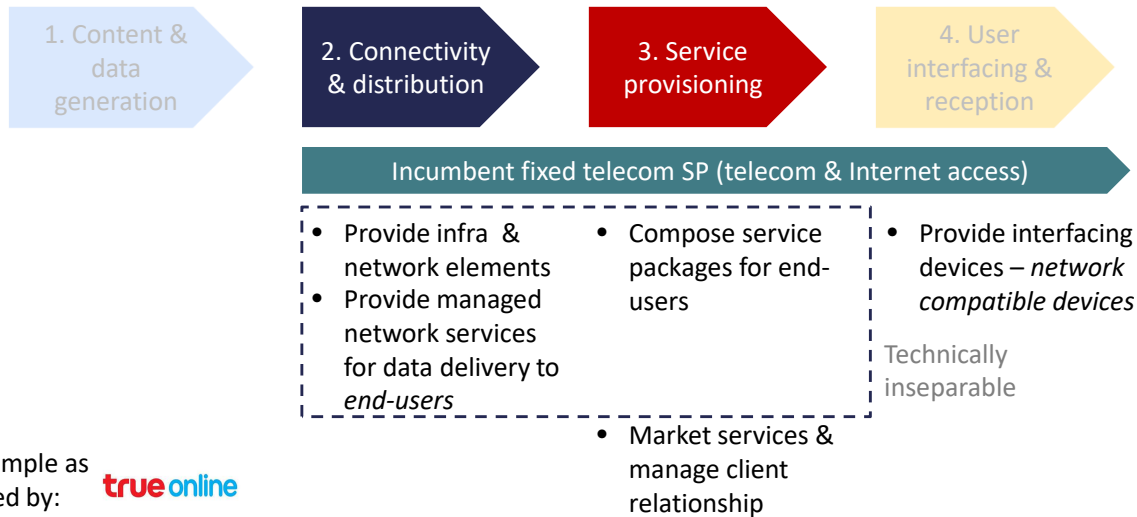
For example as provided by: **CAT**



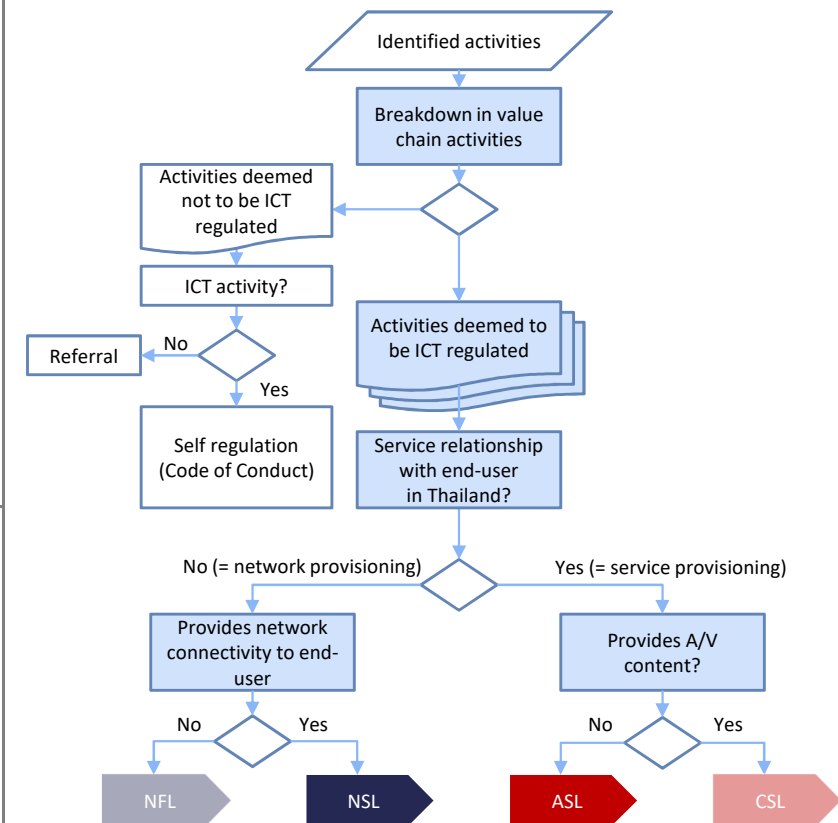
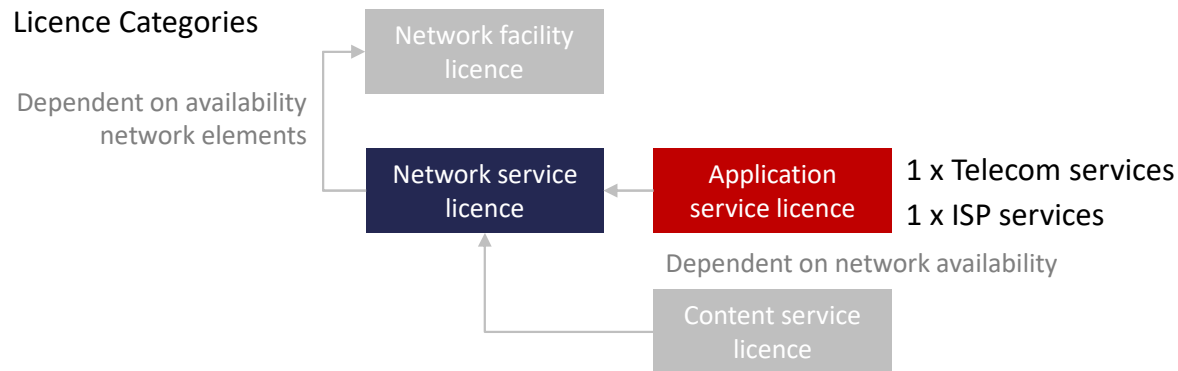
Step 1 – Example B - Fixed telecom & internet



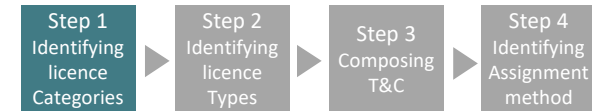
- Method
- Examples



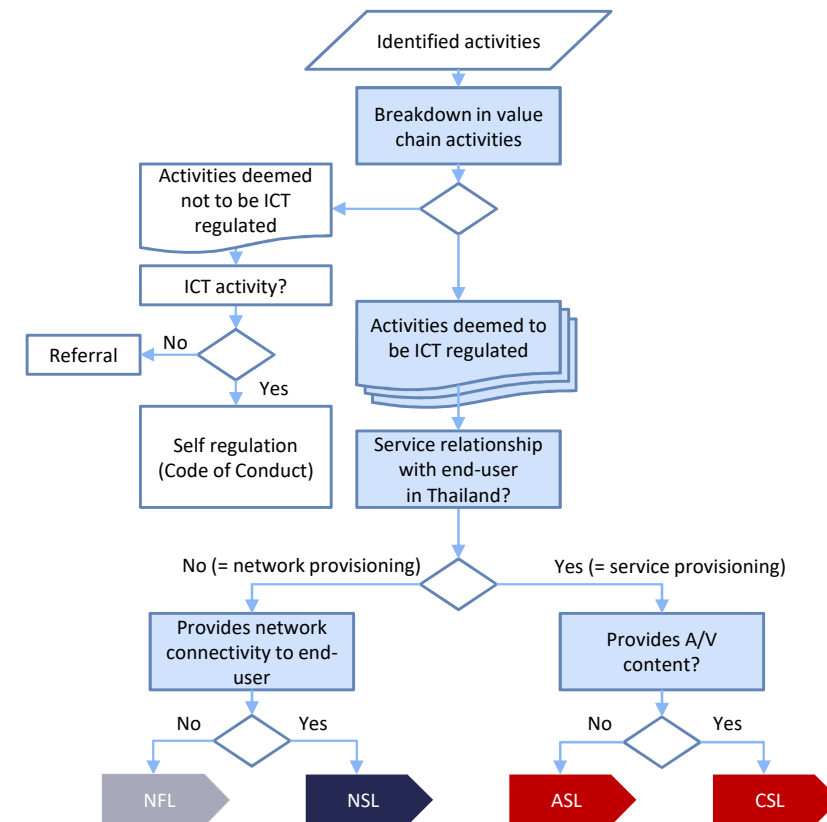
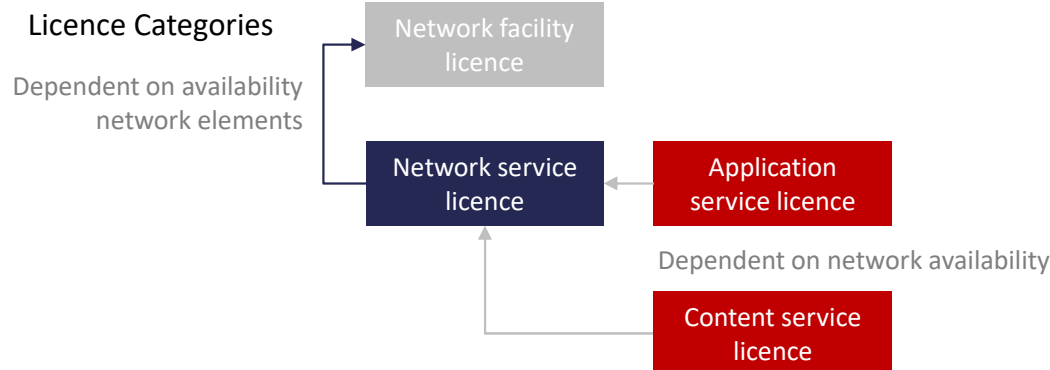
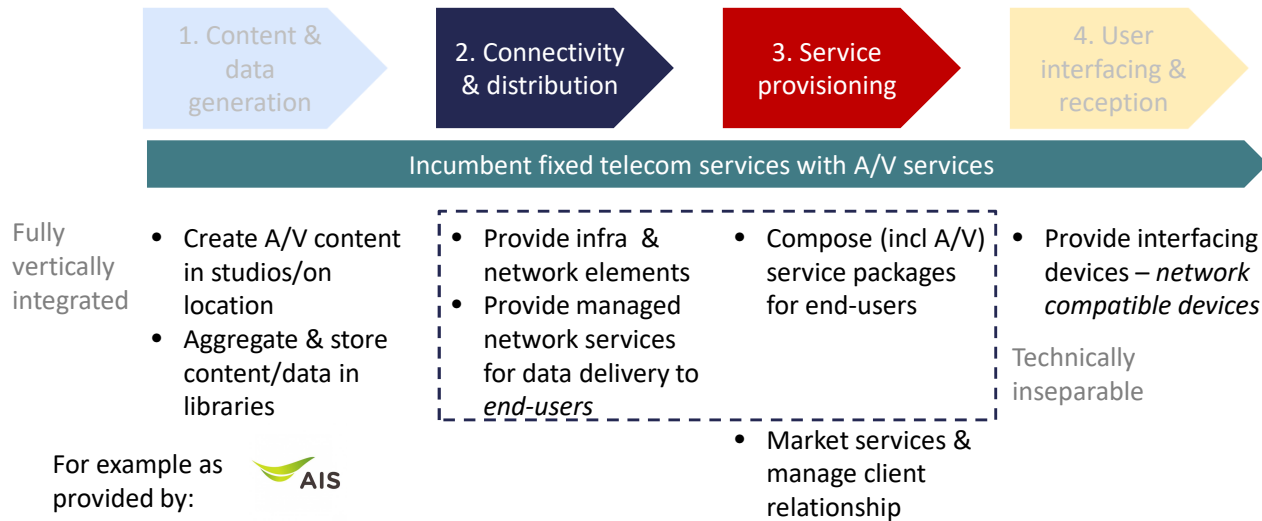
For example as provided by: **trueonline**



Step 1 – Example C - Fixed telecom & A/V



- Method
- Examples



Step 1 – Example D - FM radio (A/V)



- Method
- Examples



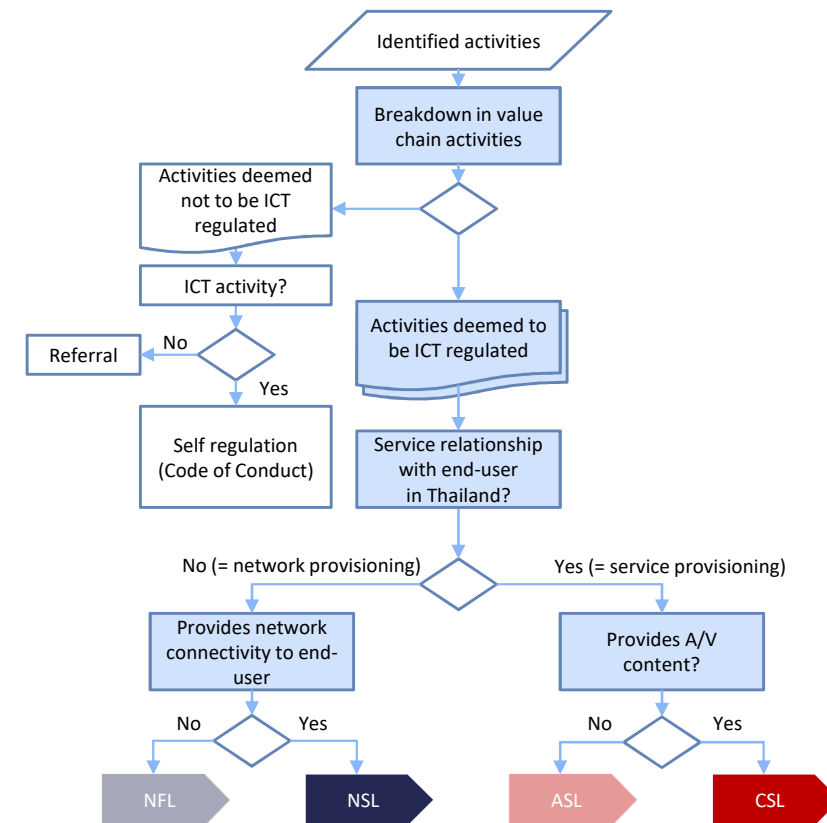
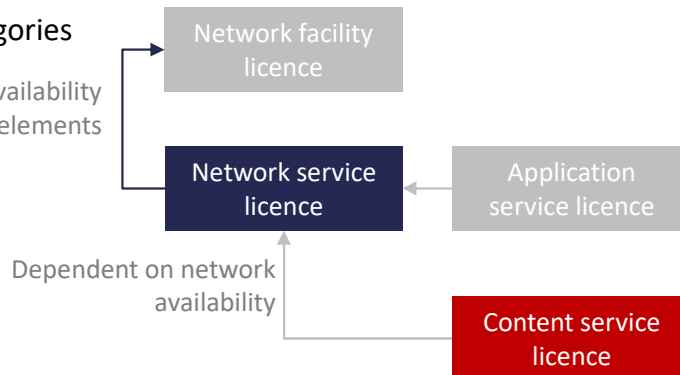
- Create A/V content in studios/online
 - Provide infra & network elements
 - Provide managed network services for data delivery to *end-users*
 - Compose A/V service packages for end-users
 - Provide interfacing devices – *network compatible devices*
 - Market services & manage client relationship
- Technically inseparable

For example as provided by:



Licence Categories

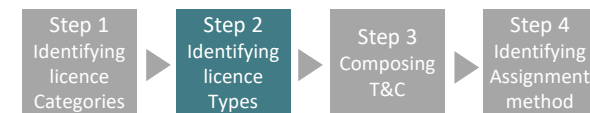
Dependent on availability network elements





Annex C: More examples Step 2

Step 2 – Example A - Telecom towers



- Method
- Examples

2. Connectivity
& distribution

Telecom towers

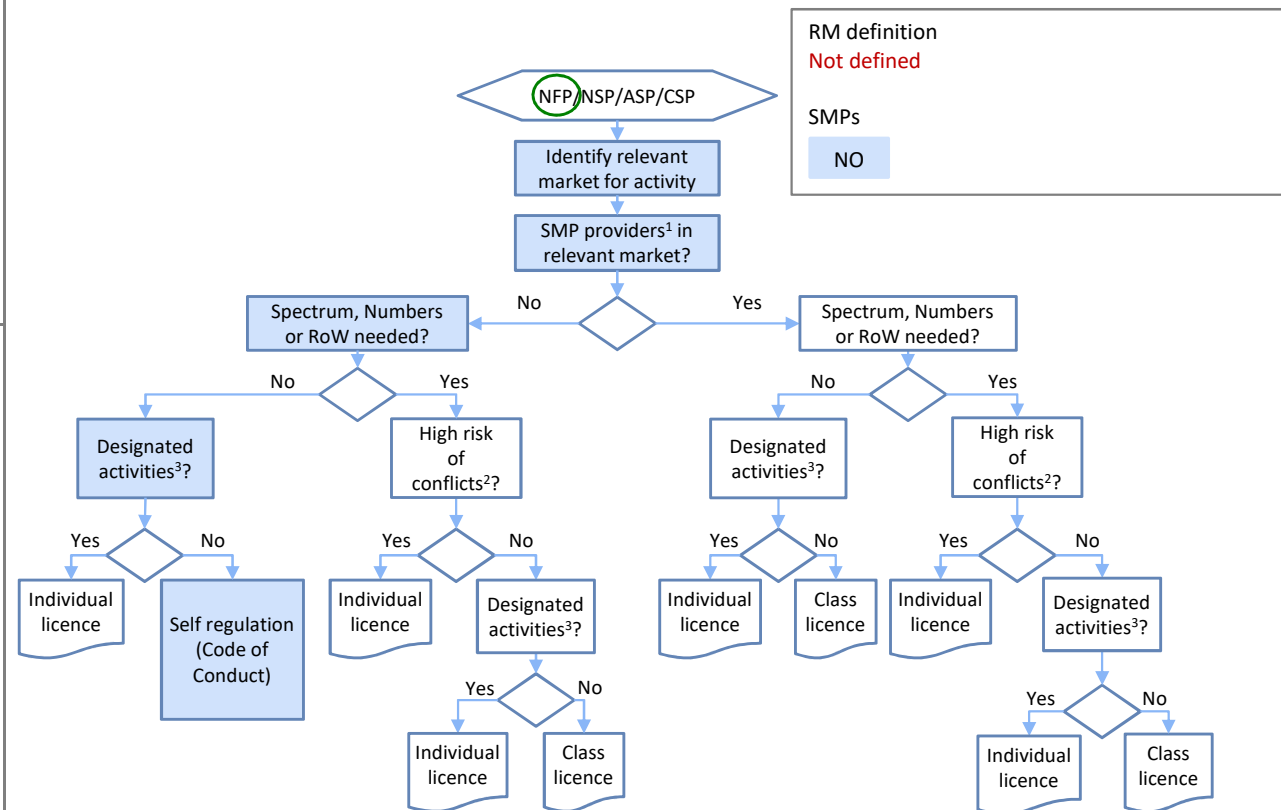
Tower rental

Code of Conduct

Network service
licence

Application
service licence

Content service
licence



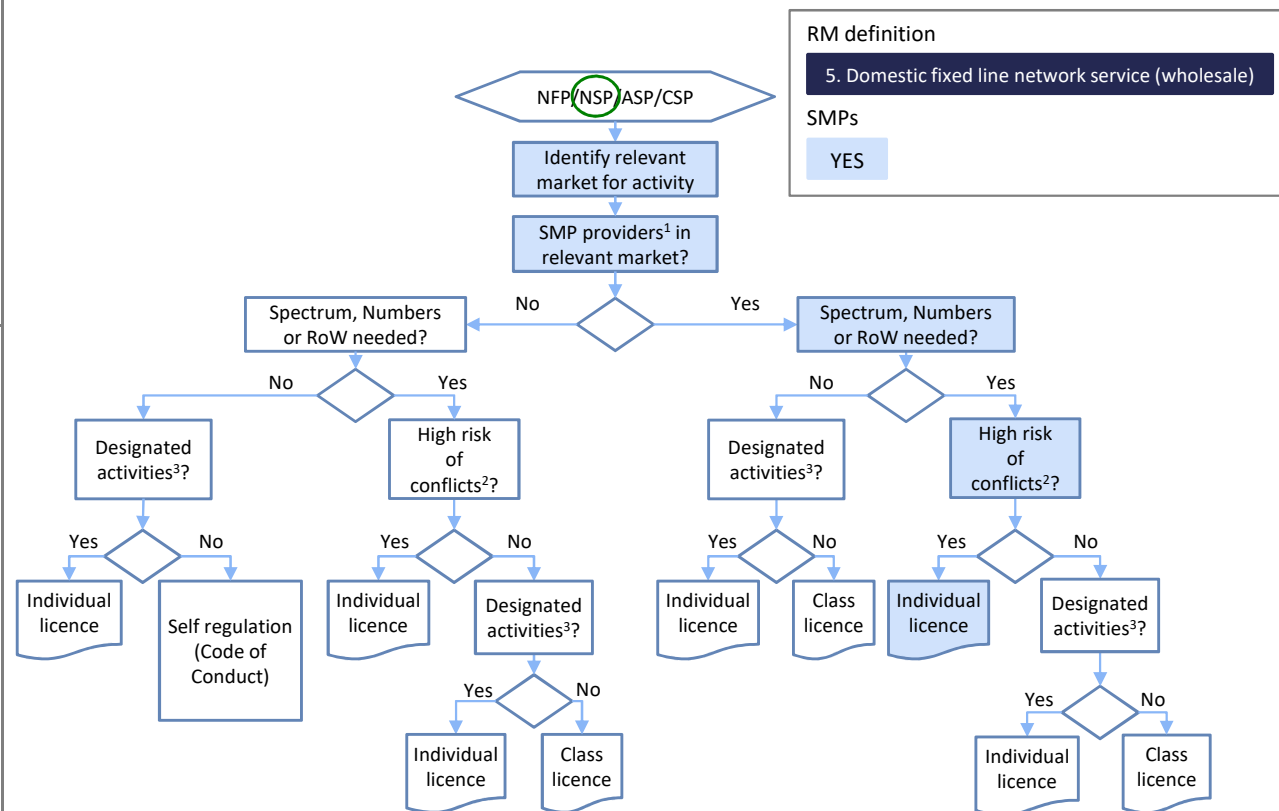
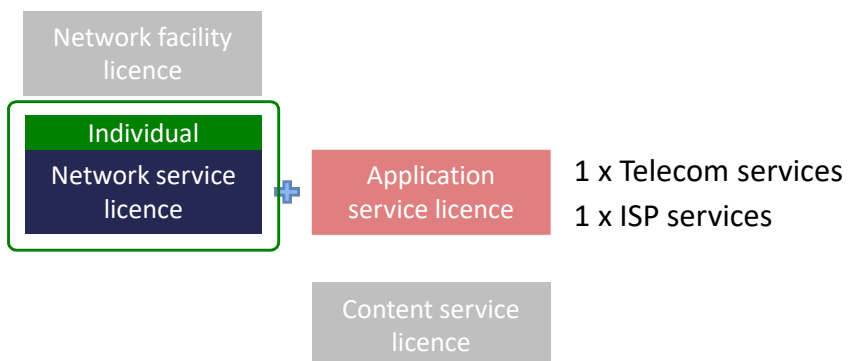
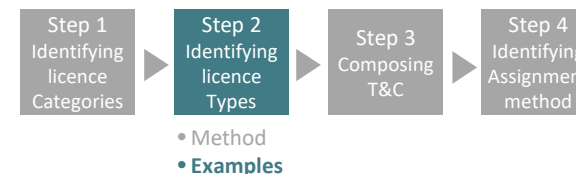
RM definition

Not defined

SMPs

NO

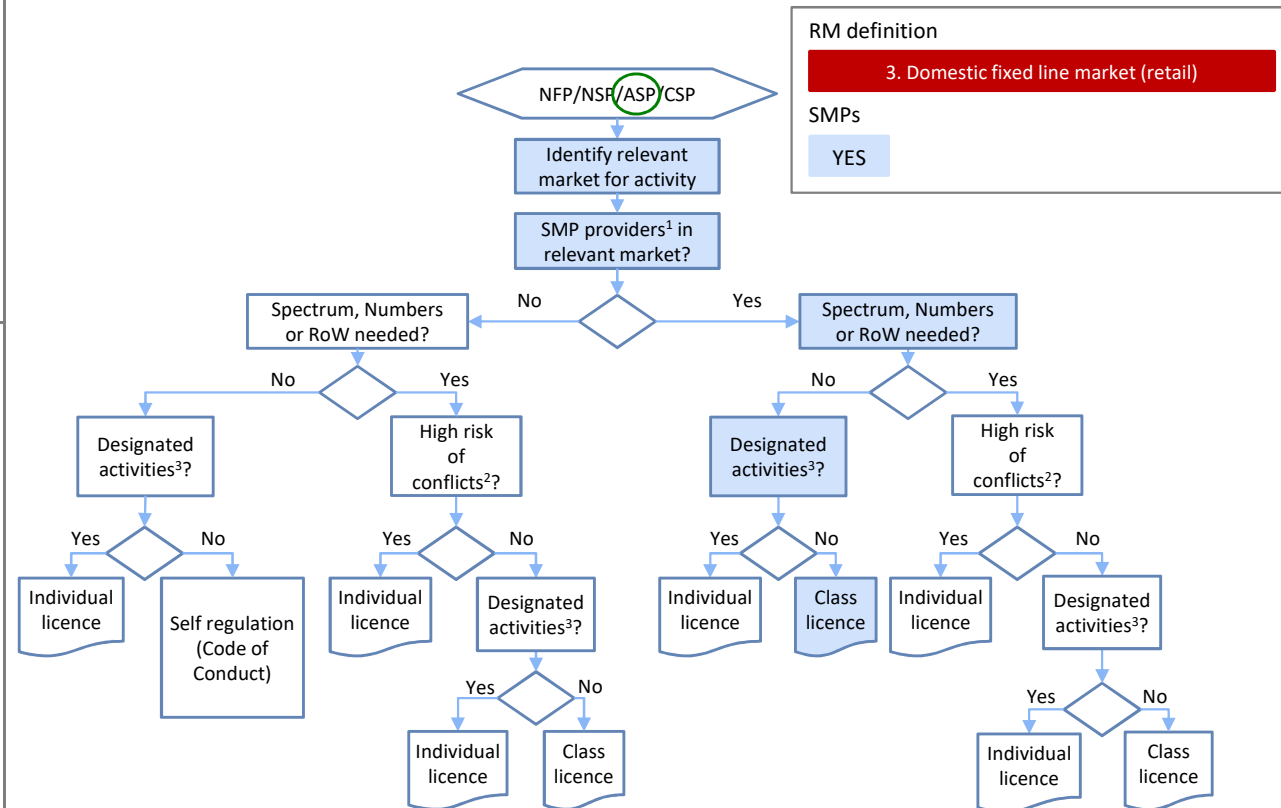
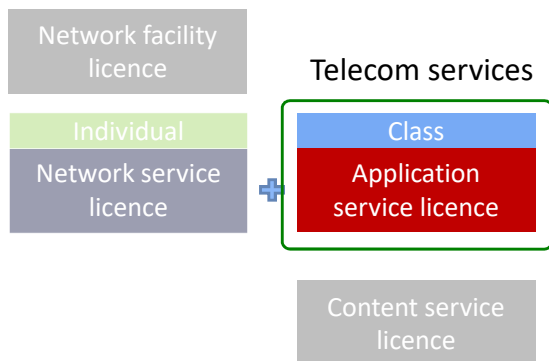
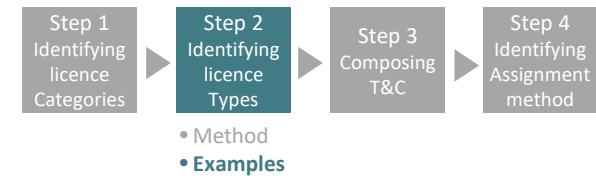
Step 2 – Example B - Fixed telecom & internet



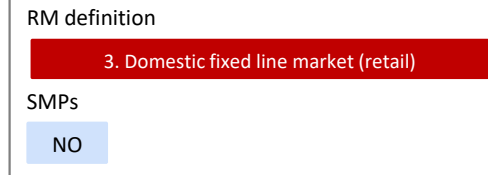
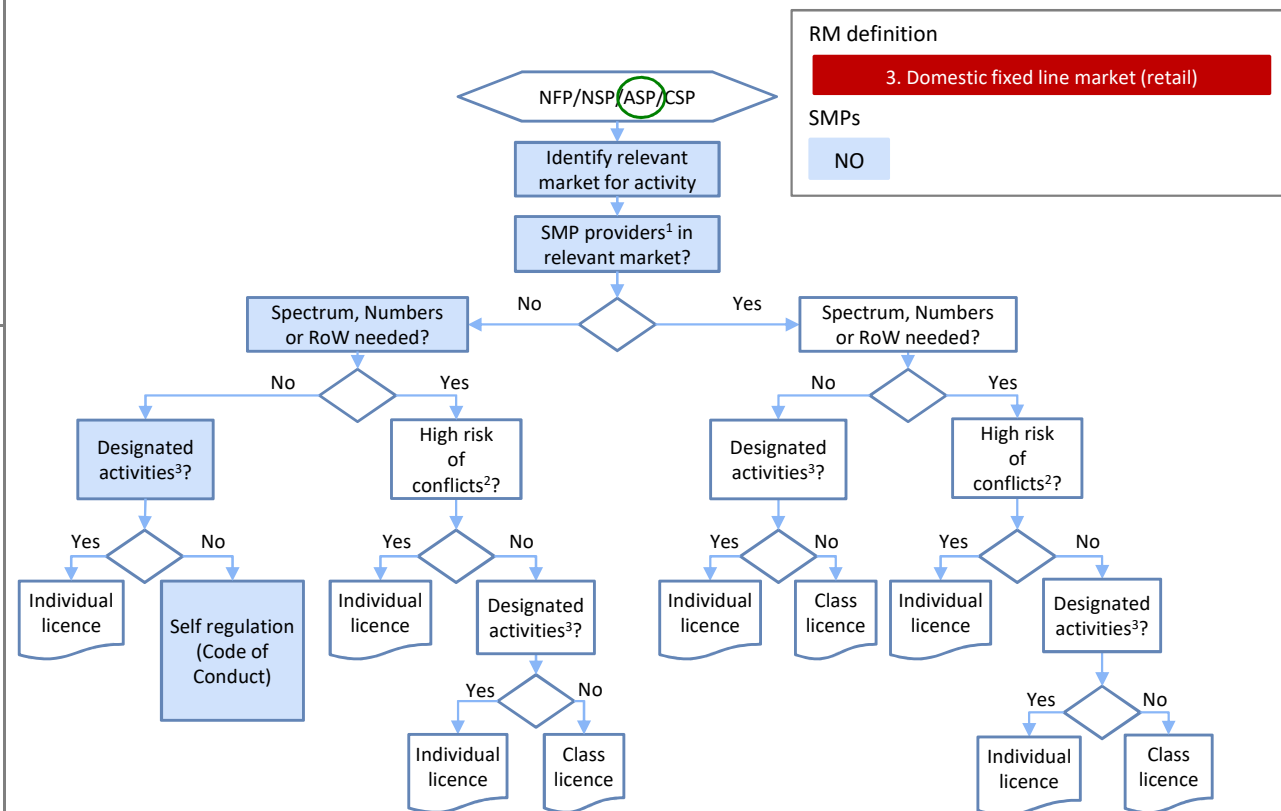
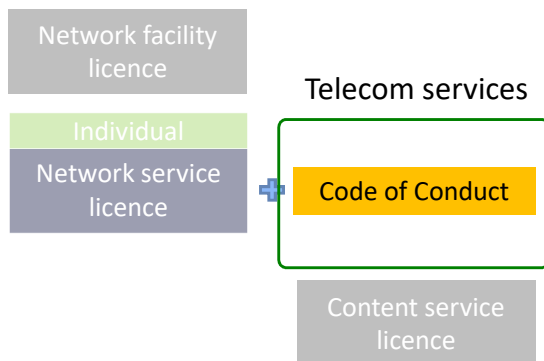
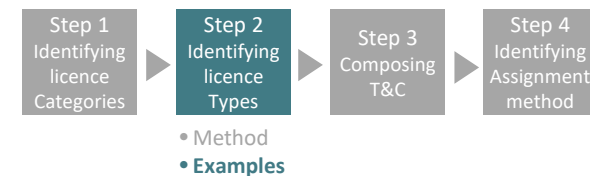
RM definition
5. Domestic fixed line network service (wholesale)

SMPs
YES

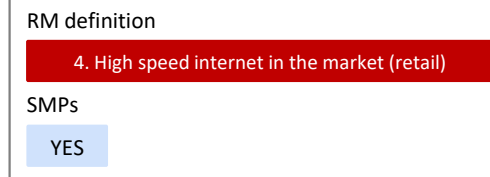
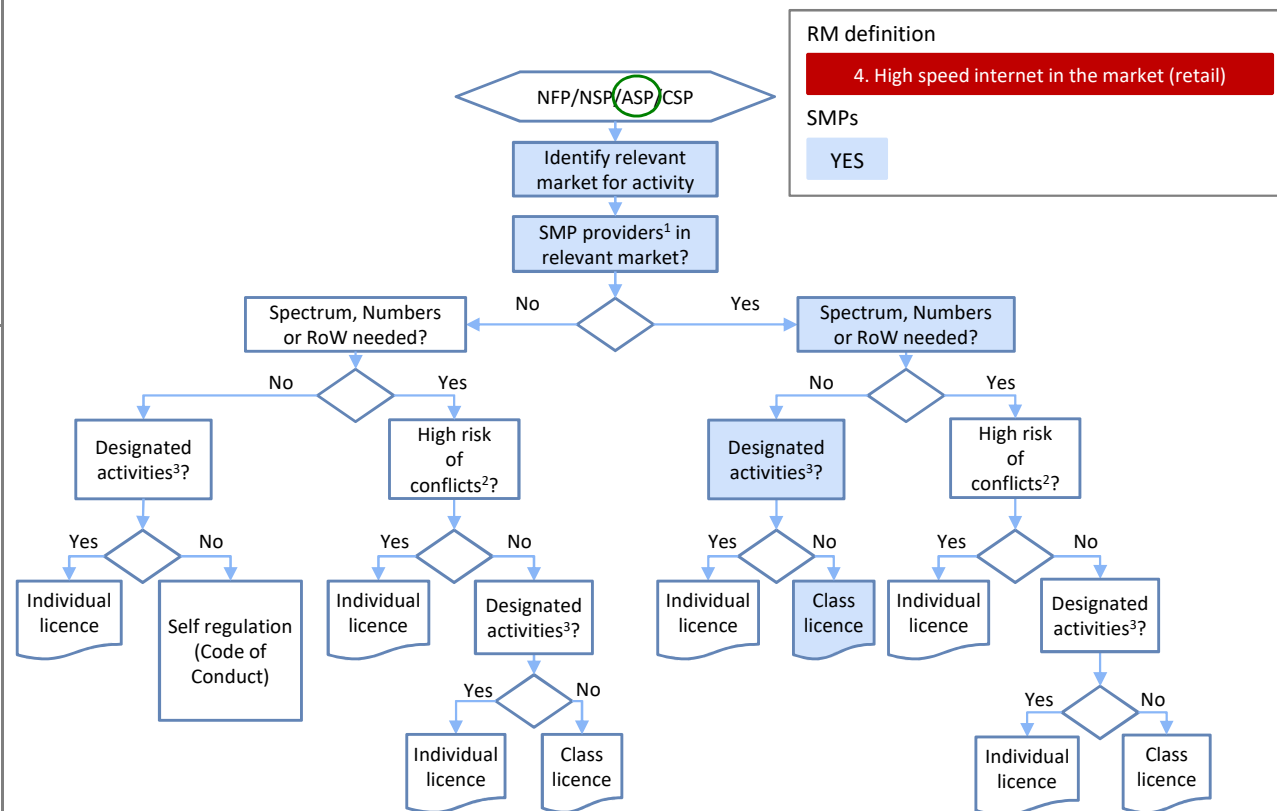
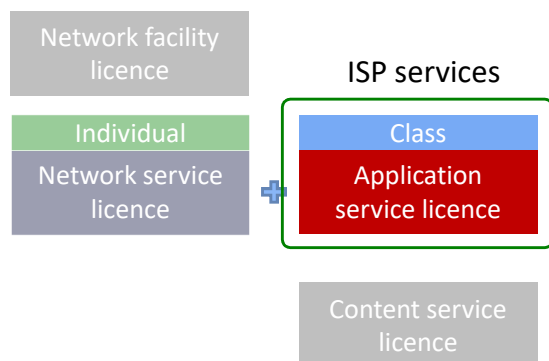
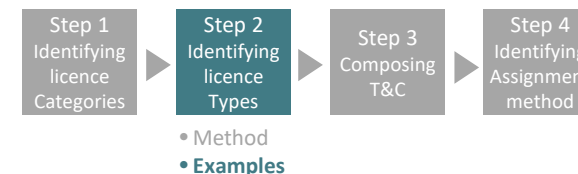
Step 2 – Example B - Fixed telecom & internet



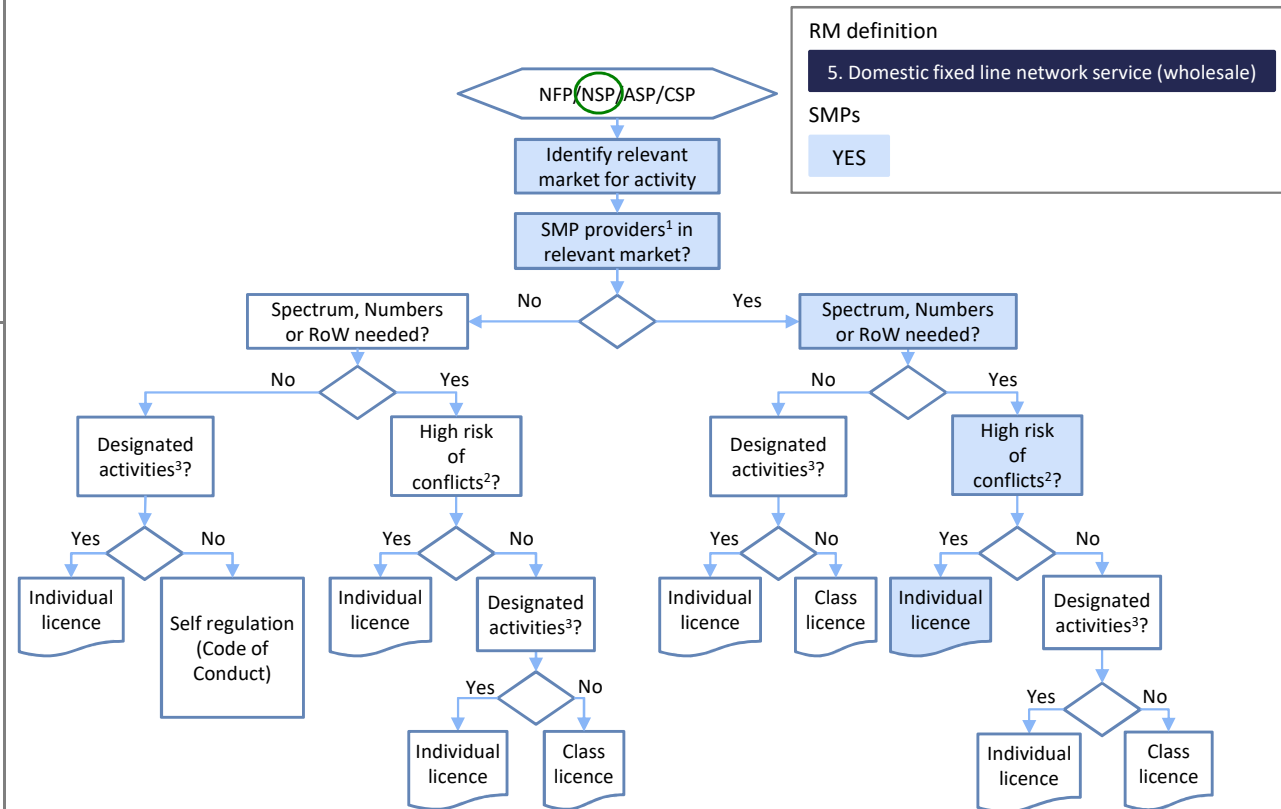
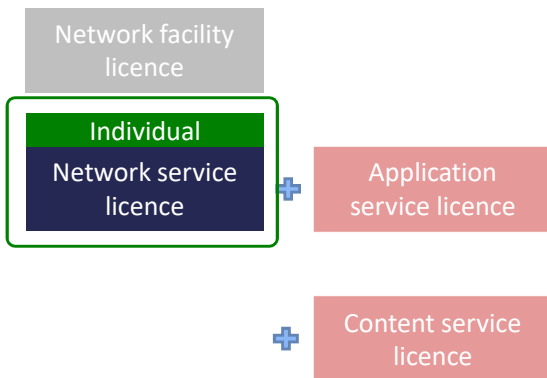
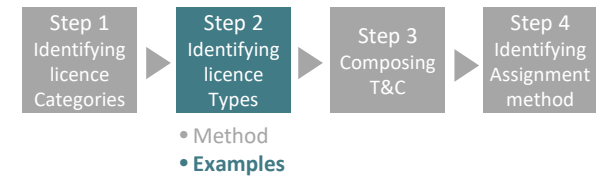
Step 2 – Example B - Fixed telecom & internet



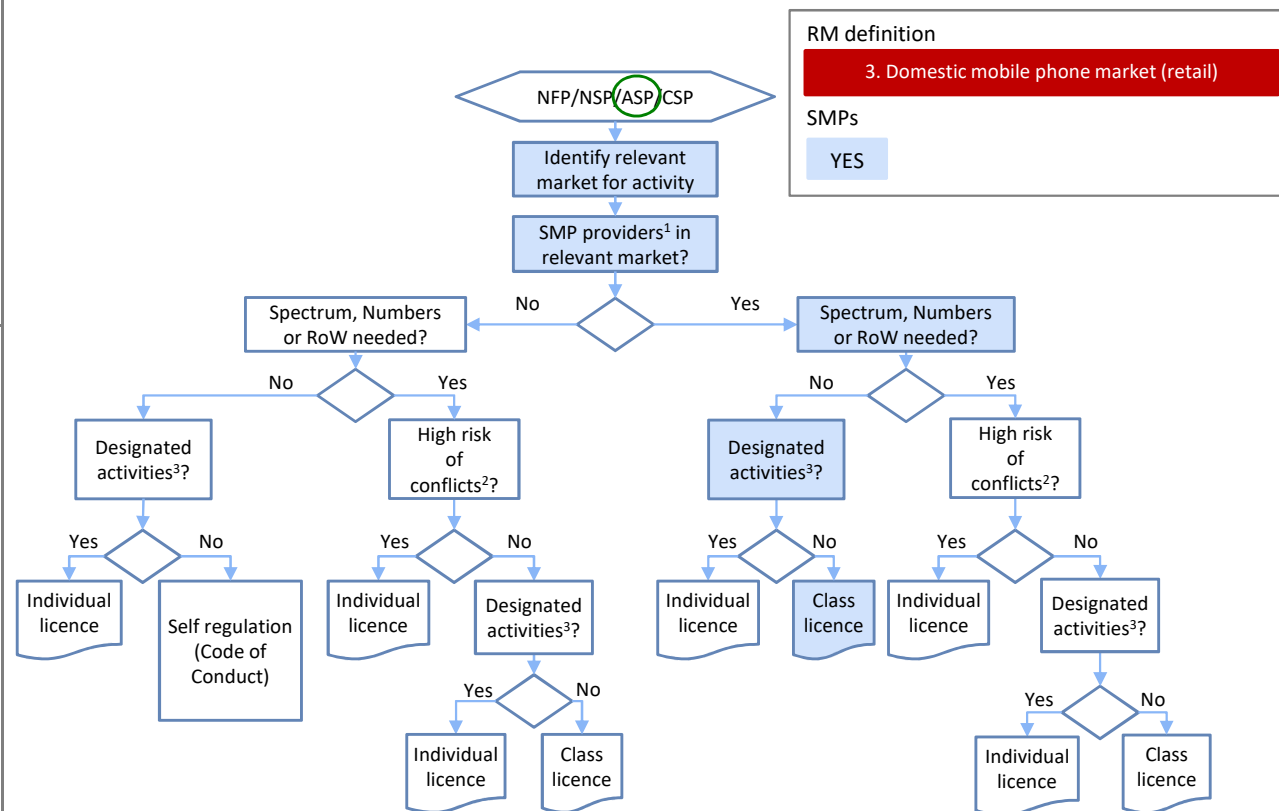
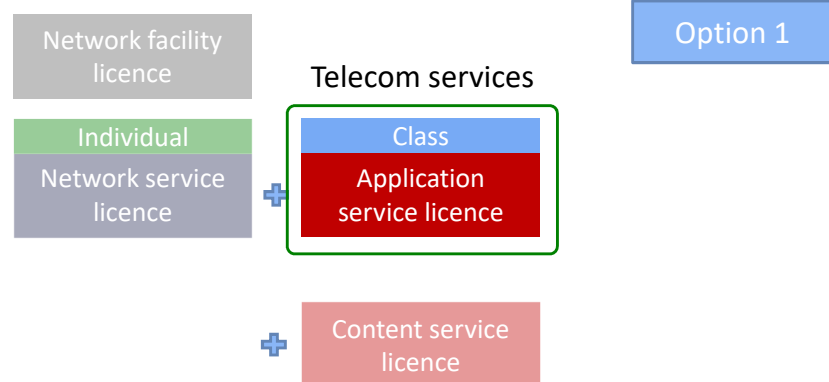
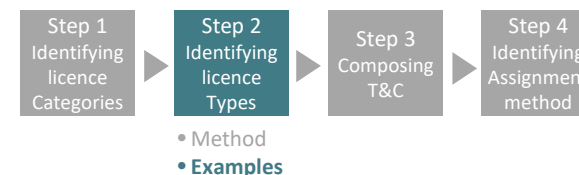
Step 2 – Example B - Fixed telecom & internet



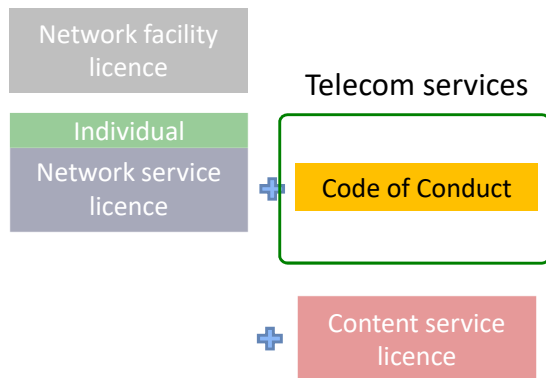
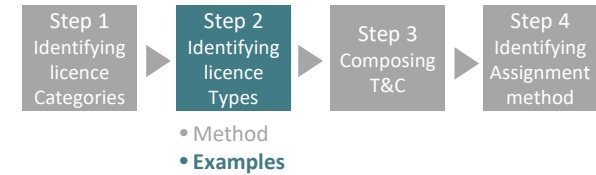
Step 2 – Example C - Fixed telecom & A/V



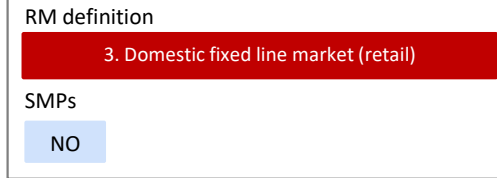
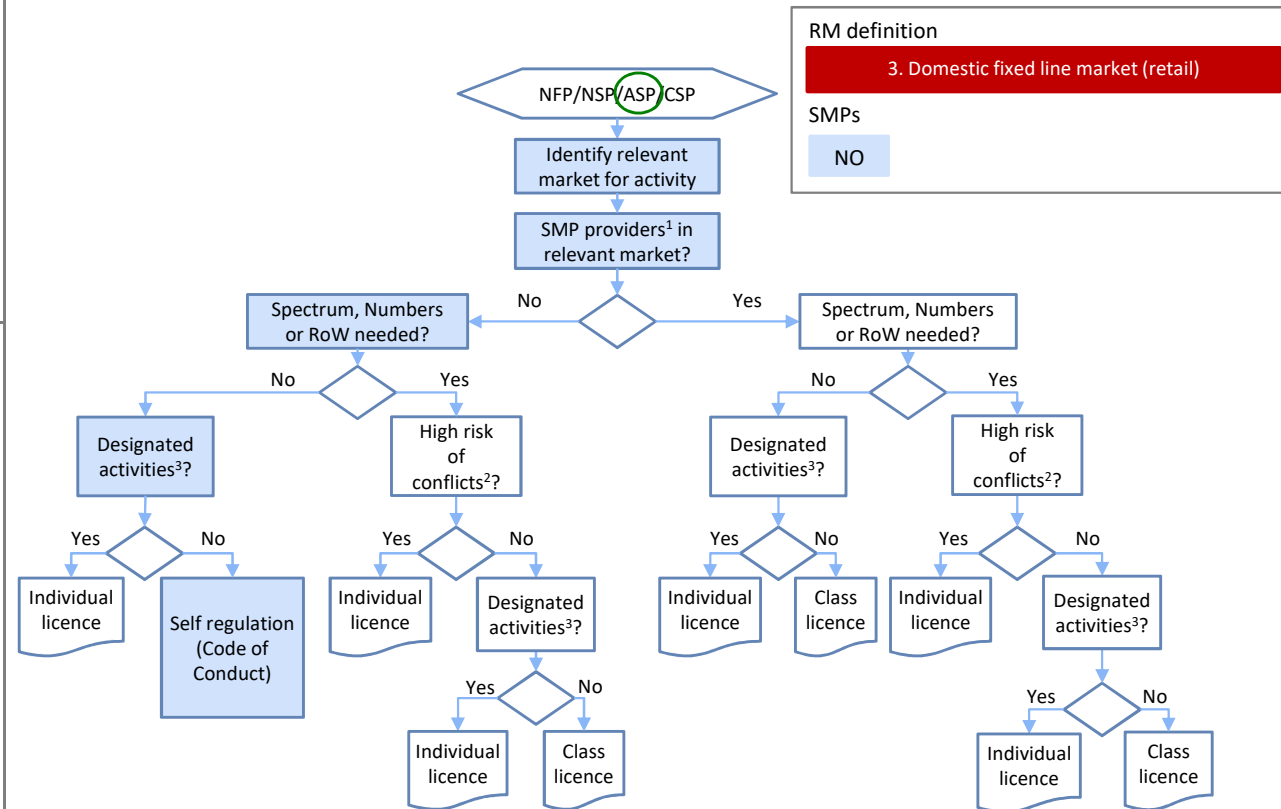
Step 2 – Example C - Fixed telecom & A/V



Step 2 – Example C - Fixed telecom & A/V



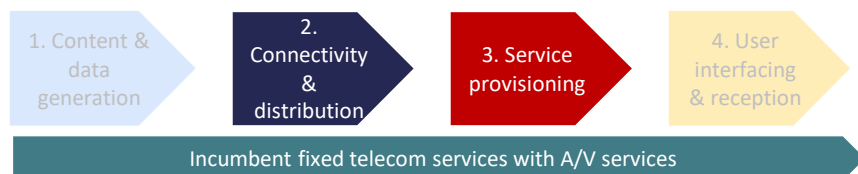
Option 2



Step 2 – Example C - Fixed telecom & A/V



- Method
- Examples



Network facility
licence

Individual
Network service
licence

+

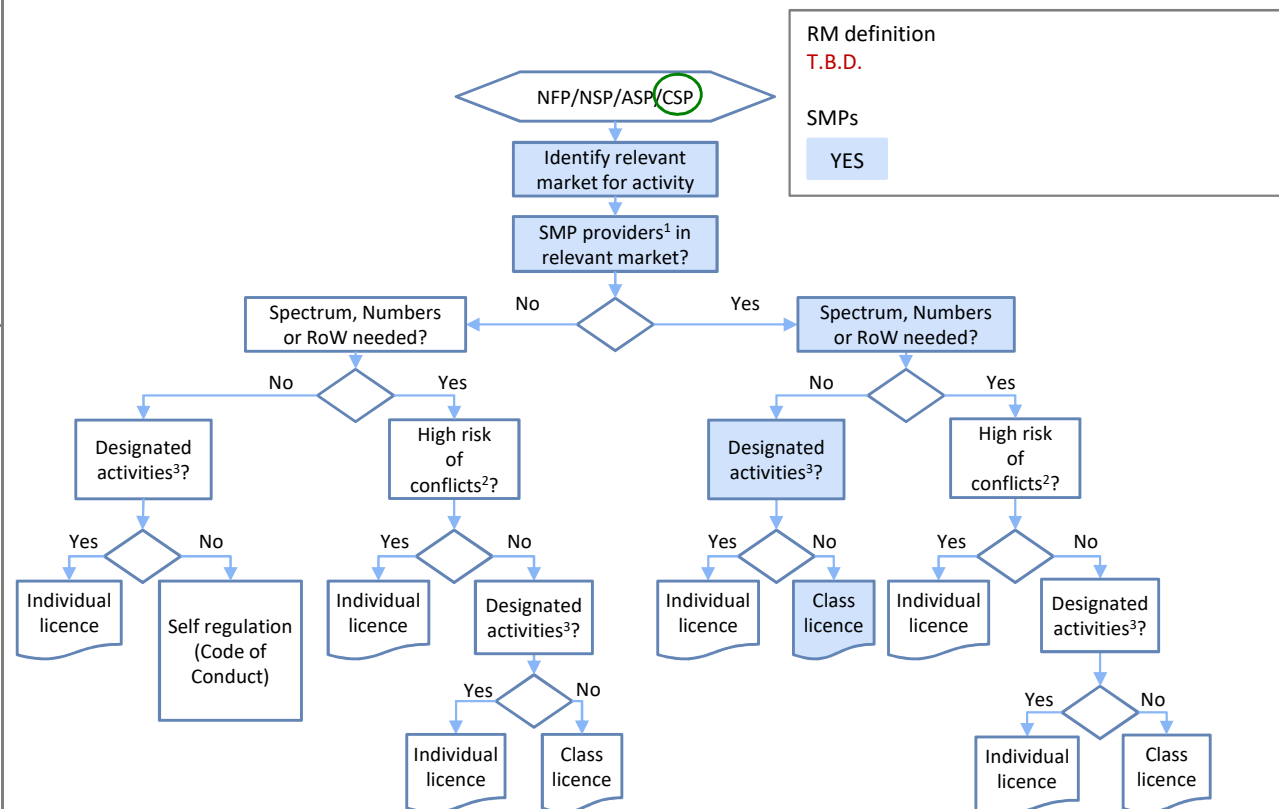
Class
Application
service licence

+

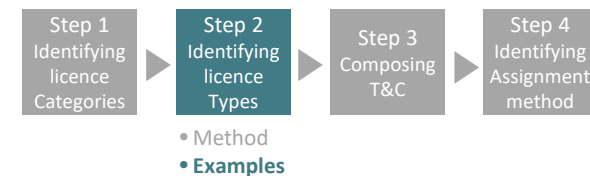
Class
Content service
licence

A/V services

Option 1



Step 2 – Example C - Fixed telecom & A/V



Network facility
licence

Individual
Network service
licence

+

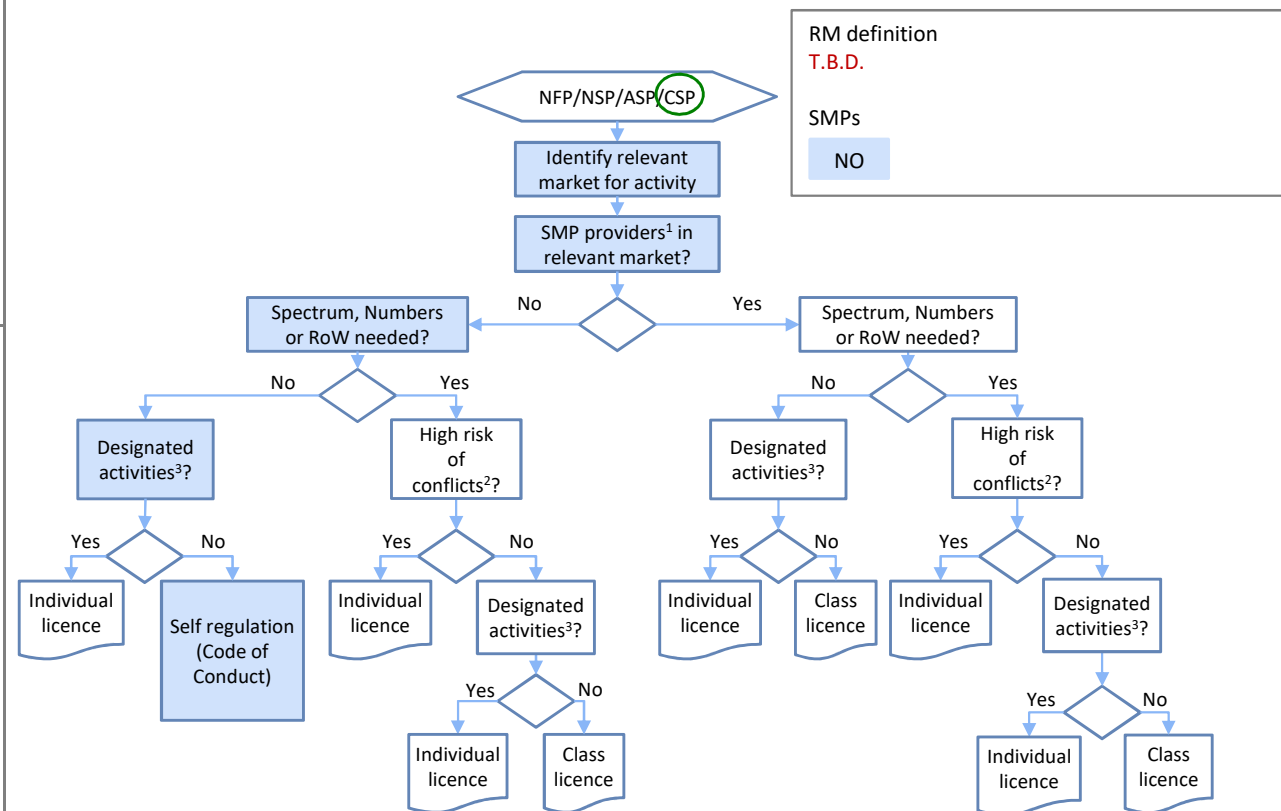
Class
Application
service licence

+

Code of Conduct

A/V services

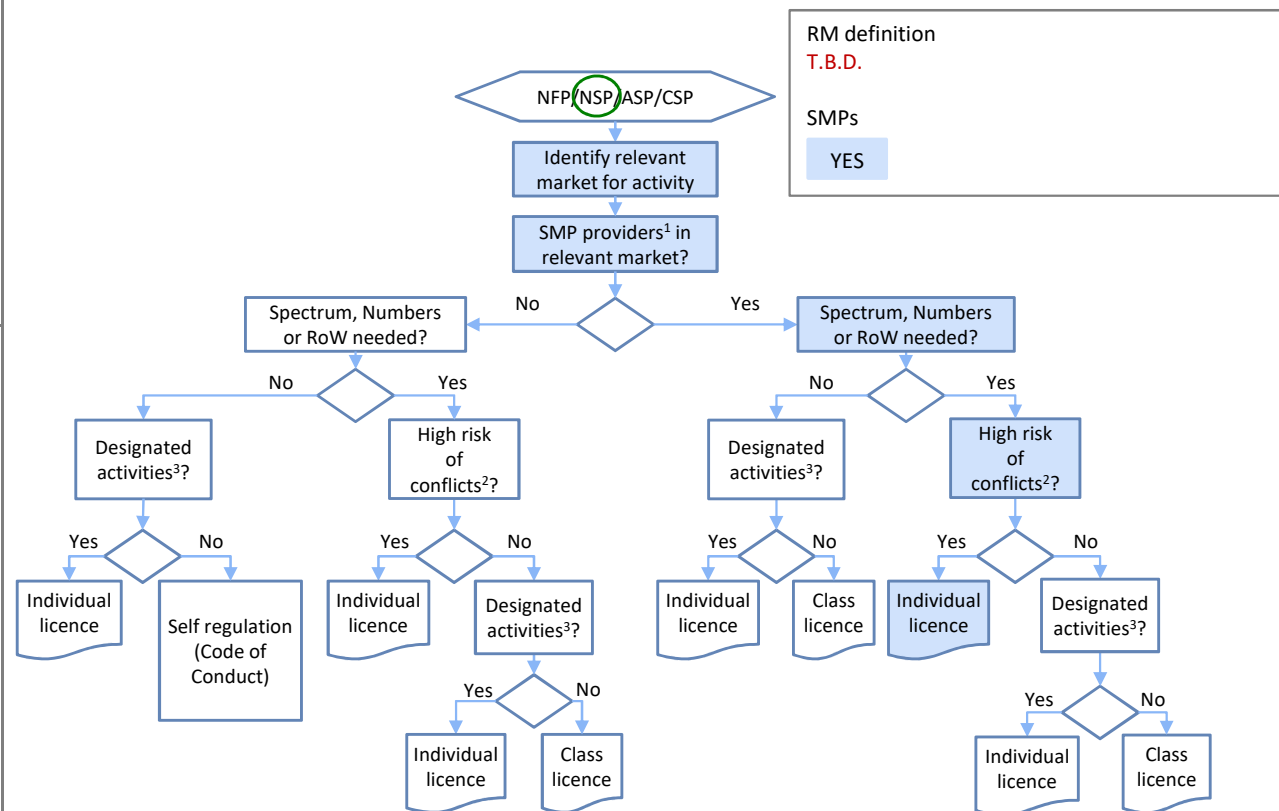
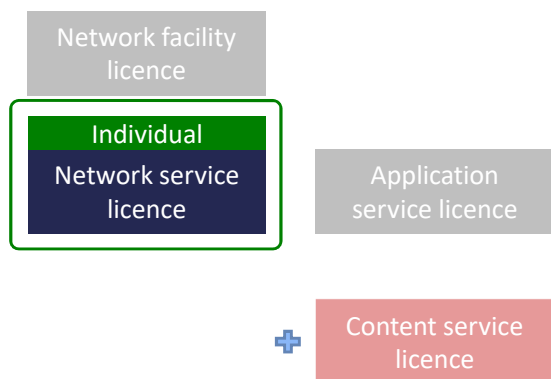
Option 2



Step 2 – Example D - FM radio (A/V)



- Method
- Examples



Step 2 – Example D - FM radio (A/V)



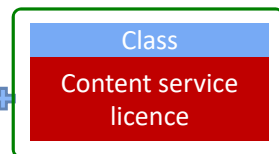
- Method
- Examples



Network facility licence

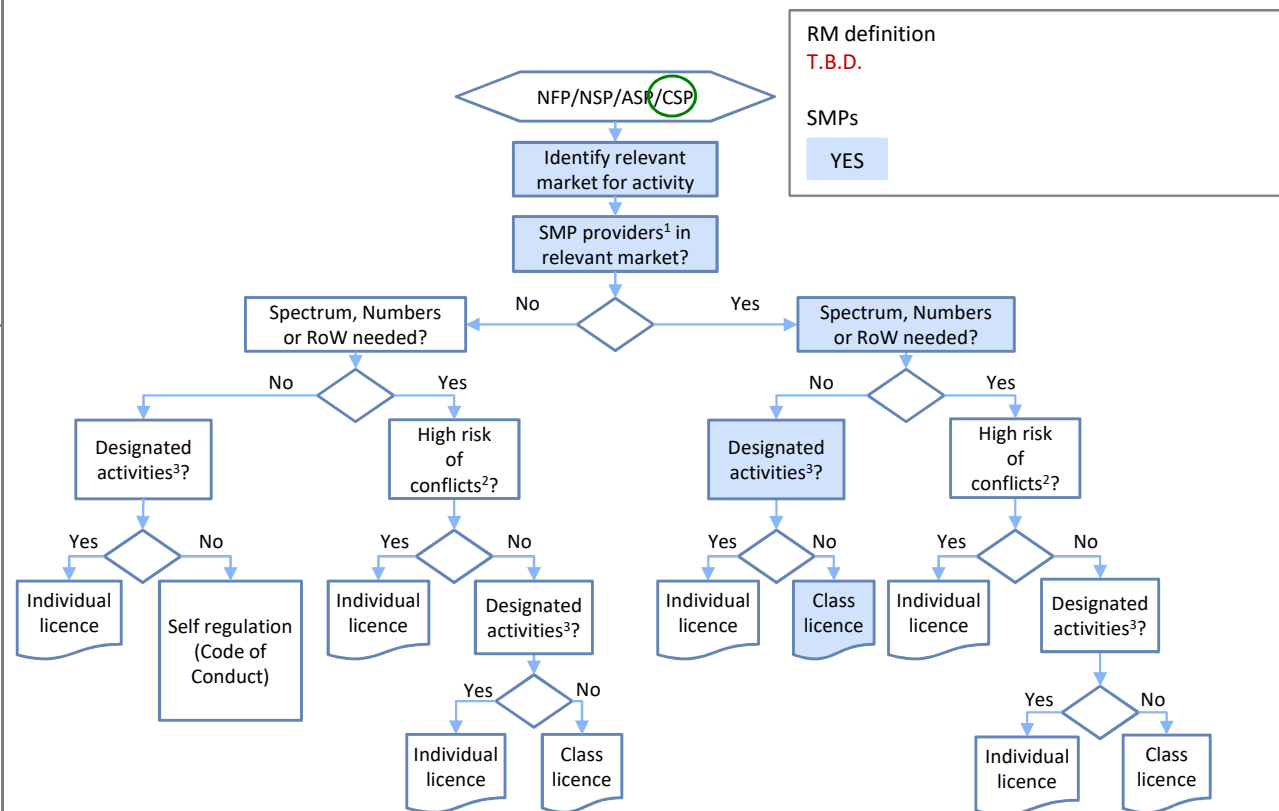
Individual
Network service licence

Application service licence

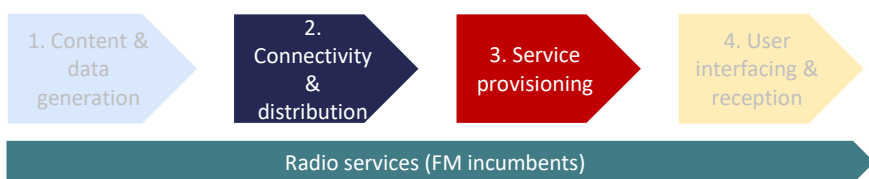
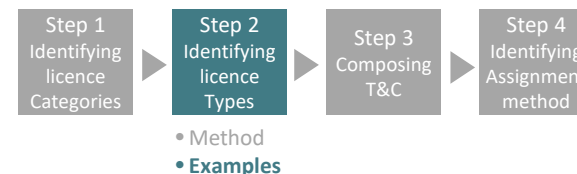


A/V services

Option 1



Step 2 – Example D - FM radio (A/V)

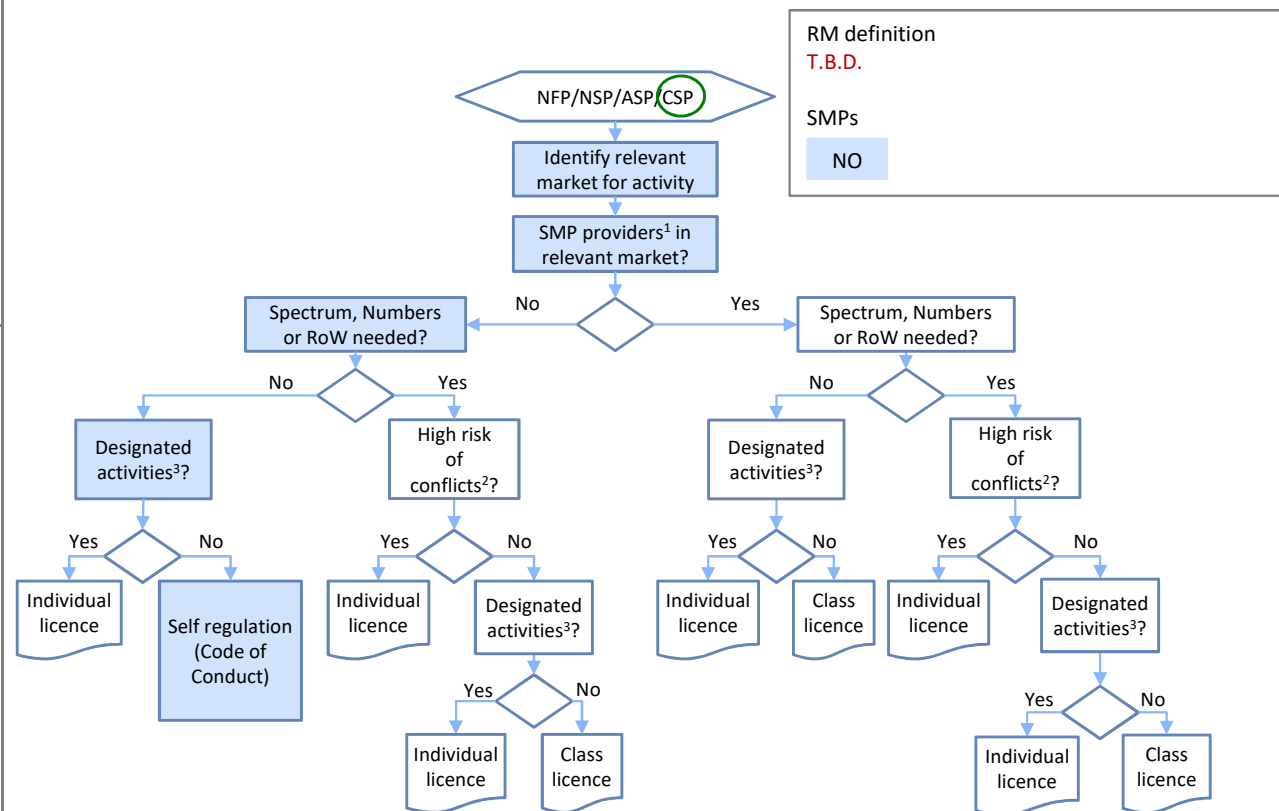
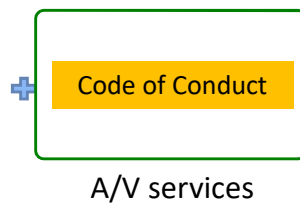


Network facility
licence

Individual
Network service
licence

Application
service licence

Option 2



RM definition
T.B.D.

SMPs
NO



Annex D: More examples Step 3

Step 3 – Example A - Telecom towers



- Method
- **Examples**

2. Connectivity
& distribution

Telecom towers

Tower rental

Code of Conduct

Network service
licence

Application
service licence

Content service
licence

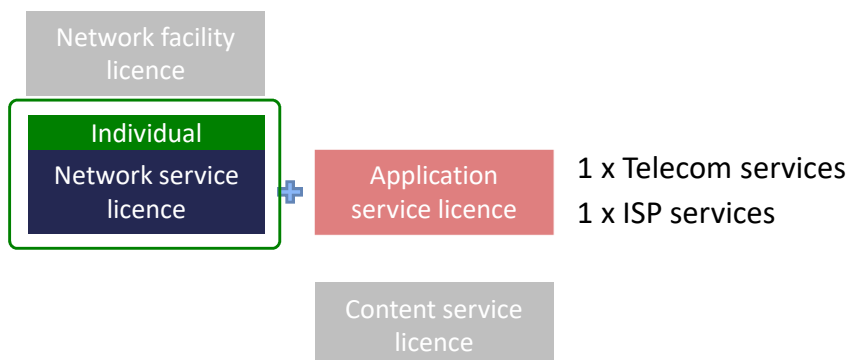
- Code of Code (for site sharing)
- NA – no licence assignment

RM	Examples
Not def.	A
SMP	
NO	

Step 3 – Example B - Fixed telecom & internet



- Method
- Examples



Additional rights	Spectrum		R1.0	R	
	Numbers	<i>Dialling numbers</i>	R2.1	R	✓
		<i>LCNs</i>	R2.2	R	
	Right of Way	<i>Overhead trajectories</i>	R3.1	R	✓
		<i>Cable ducts</i>	R3.2	R	✓
Network Operations	Operating right		N1.0	R	✓
	Network service levels	<i>Deployment schedule</i>	N3.1	O	✓
		<i>Coverage target(s)</i>	N3.2	O	✓
		<i>Network (element) availability</i>	N3.3	O	✓ ¹
	Network access & pricing (1)		N4.0	R/O	✓ ¹
	Network capacity & pricing (2)		N5.0	R/O	✓
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O	
		<i>Antennas</i>	N6.2	R/O	
		<i>Power & cooling</i>	N6.3	R/O	
	Technical criteria	<i>Interference</i>	N7.1	O	
		<i>Proper conduct & standards</i>	N7.2	O	✓
	Net neutrality		N8.0	O/R	✓
Admin provisions	Emergency & Disaster		N9.0	O	✓
	National security		N10.0	O	✓
	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O	✓
	Generic provisions		A4.0	O	✓

RM	Examples
5	1
SMP	2
YES	B
	C

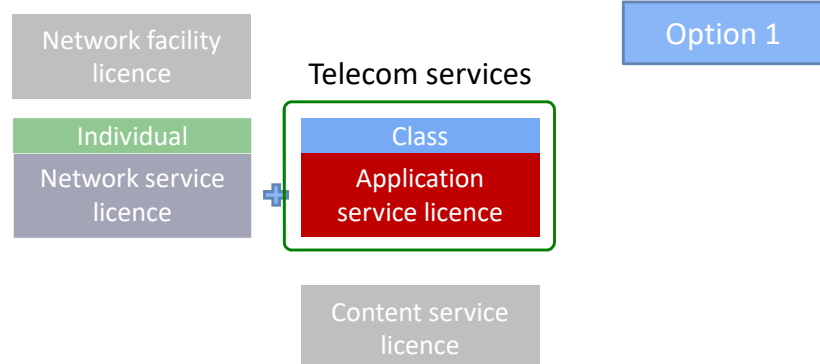
(1) For SMP companies SMP conditions apply

- ✓ = Standard T&C
- ✓ = Individual T&C
- ✓ = Standard T&C more relevant due to convergence in Thailand

Step 3 – Example B - Fixed telecom & internet



- Method
- Examples

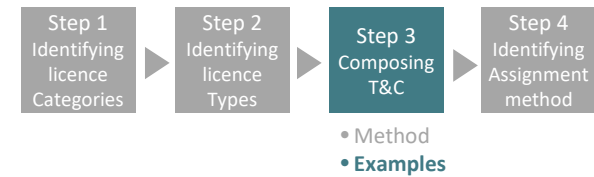


Service provisioning	Service right		S1.0	R	✓
	QoS	Service availability	S2.1	O	✓
		Technical quality	S2.2	O	
	Consumer pricing	Price cap regulation	S3.0	O	1
	Consumer Information		S4.0	O	✓
	Consumer choice	Number portability, no exit charge.	S5.0	O	✓
	Data privacy		S6.0	O	✓
	Emergency & Disaster		S7.0	O	✓
	National security		S8.0	O	✓
Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

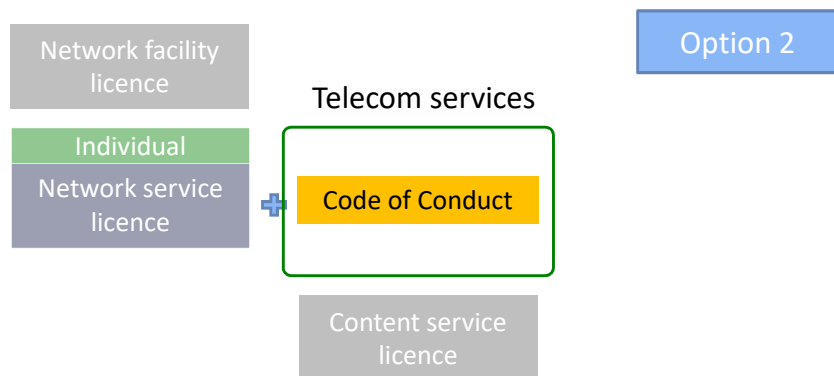
(1) For SMP companies SMP conditions apply

RM	Examples
3	B
SMP	C
YES	

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand



Step 3 – Example B - Fixed telecom & internet



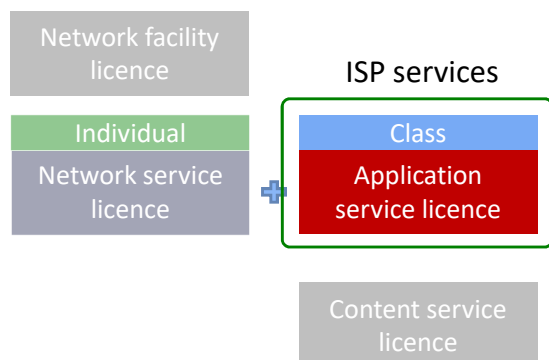
- Registration
- Code of Conduct (for Telecom services)

RM	Examples
3	B
SMP	C
NO	

Step 3 – Example B - Fixed telecom & internet



- Method
- Examples



Service provisioning	Service right		S1.0	R	✓
	QoS		S2.1	O	✓
		Service availability	S2.2	O	✓
		Technical quality	S3.0	O	✓ ¹
	Consumer pricing	Price cap regulation	S4.0	O	✓
	Consumer Information		S5.0	O	✓
	Consumer choice	Number portability, no exit charge:	S6.0	O	✓
	Data privacy		S7.0	O	✓
	Emergency & Disaster		S8.0	O	✓
Admin provisions	National security				
	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

(1) For SMP companies SMP conditions apply

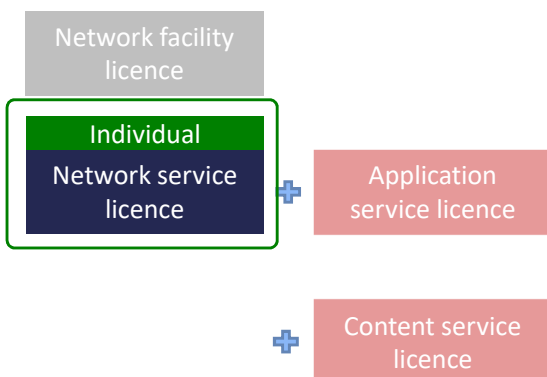
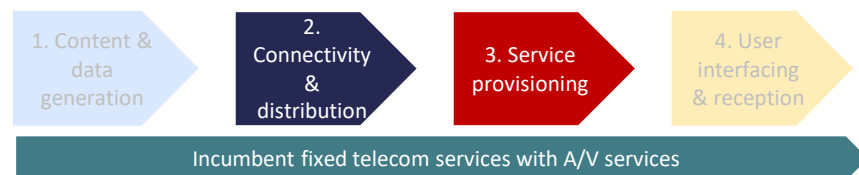
RM	Examples
4	2
SMP	3
YES	B

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand

Step 3 – Example C - Fixed telecom & A/V



- Method
- Examples



Additional rights	Spectrum		R1.0	R	
	Numbers	<i>Dialling numbers</i>	R2.1	R	✓
		<i>LCNs</i>	R2.2	R	
	Right of Way	<i>Overhead trajectories</i>	R3.1	R	✓
		<i>Cable ducts</i>	R3.2	R	✓
Network Operations	Operating right		N1.0	R	✓
	Network service levels	<i>Deployment schedule</i>	N3.1	O	✓
		<i>Coverage target(s)</i>	N3.2	O	✓
		<i>Network (element) availability</i>	N3.3	O	✓ ¹
	Network access & pricing (1)		N4.0	R/O	✓ ¹
	Network capacity & pricing (2)		N5.0	R/O	✓
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O	
		<i>Antennas</i>	N6.2	R/O	
		<i>Power & cooling</i>	N6.3	R/O	
	Technical criteria	<i>Interference</i>	N7.1	O	
		<i>Proper conduct & standards</i>	N7.2	O	✓
	Net neutrality		N8.0	O/R	✓
	Emergency & Disaster		N9.0	O	✓
	National security		N10.0	O	✓
Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O	✓
	Generic provisions		A4.0	O	✓

RM	Examples
5	1
SMP	2
YES	B
	C

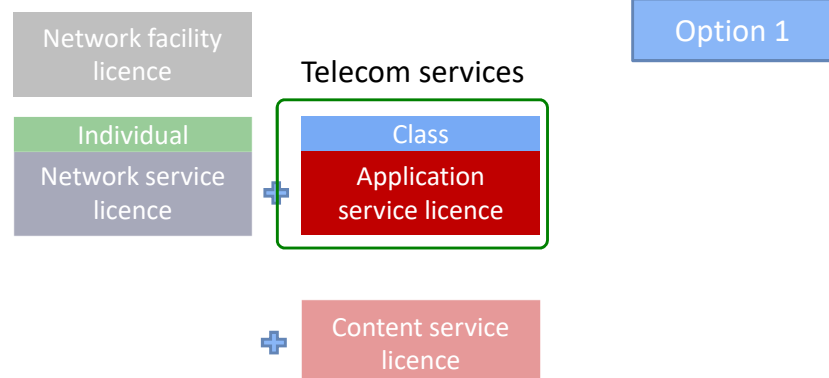
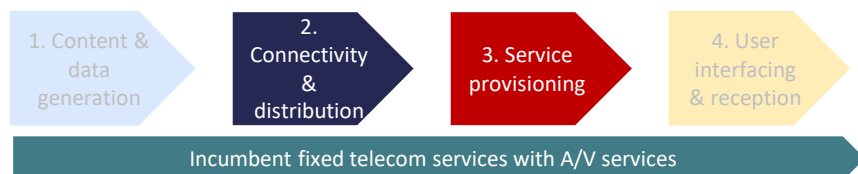
(1) For SMP companies SMP conditions apply

- ✓ = Standard T&C
- ✓ = Individual T&C
- ✓ = Standard T&C more relevant due to convergence in Thailand

Step 3 – Example C - Fixed telecom & A/V



- Method
- Examples



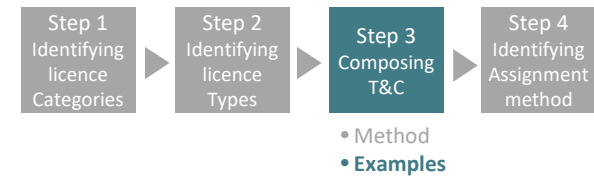
Service provisioning	Service right		S1.0	R	✓
	QoS		S2.1	O	✓
		Service availability	S2.2	O	
		Technical quality	S3.0	O	1
	Consumer pricing	Price cap regulation	S4.0	O	✓
	Consumer Information		S5.0	O	✓
	Consumer choice	Number portability, no exit charge:	S6.0	O	✓
	Data privacy		S7.0	O	✓
	Emergency & Disaster		S8.0	O	✓
	National security				✓

Admin provisions	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	Renewal, transfer & mergers	A3.0	O	✓
	Generic provisions		A4.0	O	✓

(1) For SMP companies SMP conditions apply

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand

RM	Examples
3	B
SMP	C
YES	

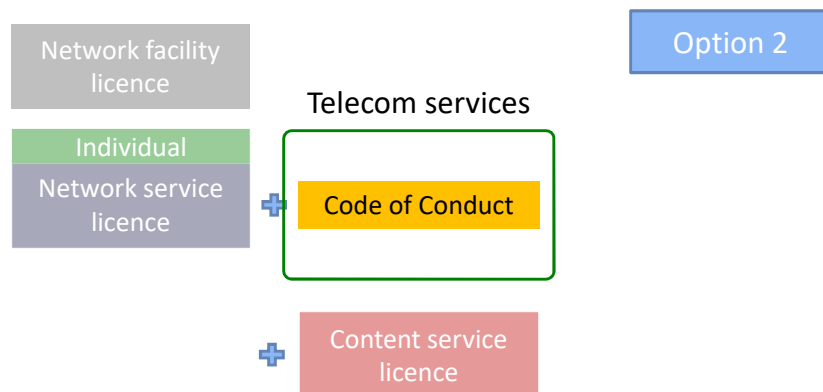


Step 3 – Example C - Fixed telecom & A/V



- Registration
- Code of Conduct (for Telecom services)

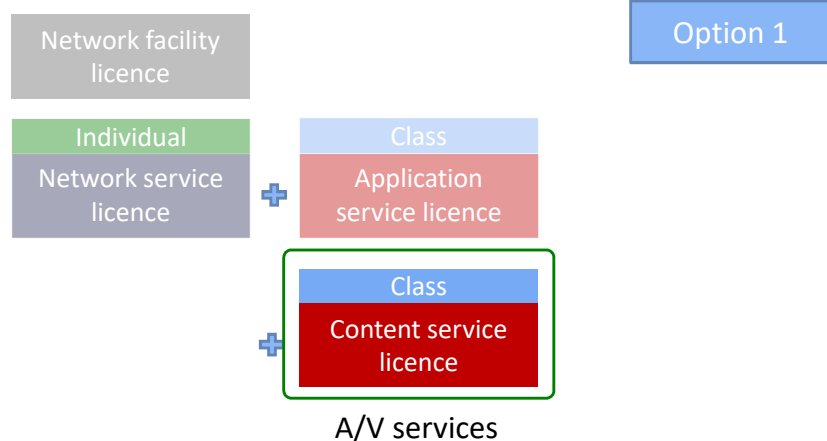
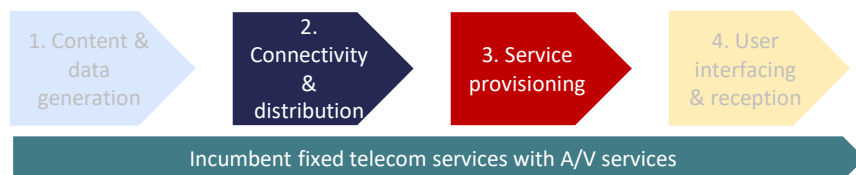
RM	Examples
3	B
SMP	C
NO	



Step 3 – Example C - Fixed telecom & A/V



- Method
- Examples



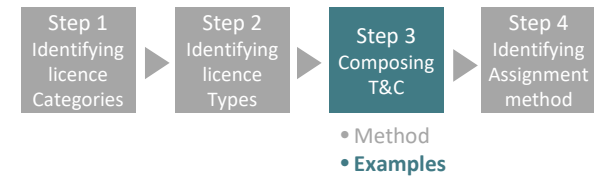
Content provisioning	Content right	C1.0	R	✓
	Editorial	C2.0	O	
	Advertising	C3.0	R/O	
	Proper content	C4.0	O	✓
	IPR	C5.0	O	✓

Service provisioning	Service right	S1.0	R	✓
	QoS	S2.1	O	
	<i>Service availability</i>	S2.2	O	
	<i>Technical quality</i>	S3.0	O	
	Consumer pricing	S4.0	O	✓
	Consumer Information	S5.0	O	✓
	Consumer choice	S6.0	O	✓
	<i>Price cap regulation</i>	S7.0	O	✓
	<i>Number portability, no exit charge:</i>	S8.0	O	

Admin provisions	Fees	A1.0	O	✓
	Reporting	A2.0	O	✓
	License ownership	A3.0	O	✓
	Generic provisions	A4.0	O	✓

RM	Examples
T.B.D	5
SMP	C
YES	D

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand

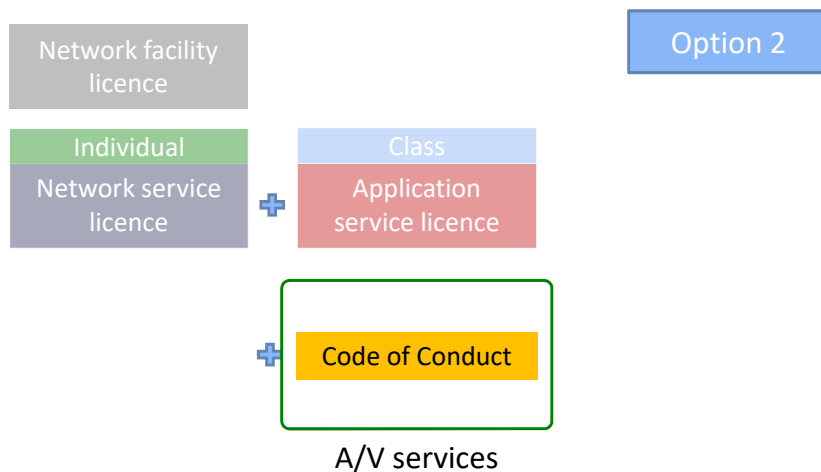


Step 3 – Example C - Fixed telecom & A/V



- Registration
- Code of Conduct (for A/V services)

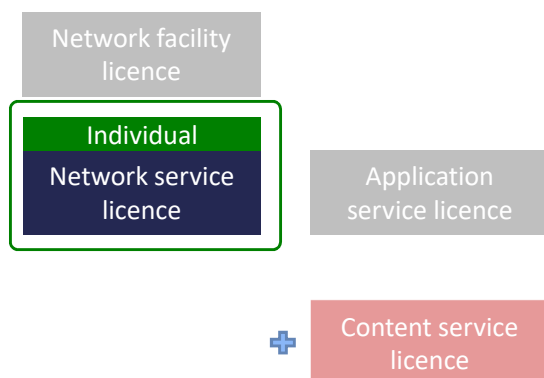
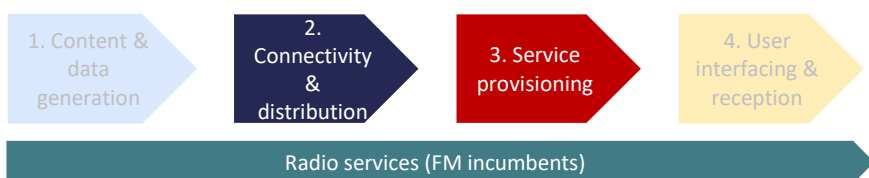
RM	Examples
T.B.D	5
SMP	C
NO	D



Step 3 – Example D - FM radio (A/V)



- Method
- Examples



Additional rights	Spectrum Numbers		R1.0	R	✓
	<i>Dialling numbers</i>		R2.1	R	
	<i>LCNs</i>		R2.2	R	
	Right of Way		R3.1	R	
Network Operations			R3.2	R	
	Operating right		N1.0	R	✓
	Network service levels	<i>Deployment schedule</i>	N3.1	O	✓
		<i>Coverage target(s)</i>	N3.2	O	✓
		<i>Network (element) availability</i>	N3.3	O	✓
	Network access & pricing (1)		N4.0	R/O	✓ ¹
	Network capacity & pricing (2)		N5.0	R/O	✓
	Facility sharing & pricing (3)	<i>Towers & physical sites</i>	N6.1	R/O	✓
		<i>Antennas</i>	N6.2	R/O	
		<i>Power & cooling</i>	N6.3	R/O	
Admin provisions	Technical criteria	<i>Interference</i>	N7.1	O	✓
		<i>Proper conduct & standards</i>	N7.2	O	✓
	Net neutrality		N8.0	O/R	
	Emergency & Disaster		N9.0	O	✓
	National security		N10.0	O	
	Fees		A1.0	O	✓
	Reporting		A2.0	O	✓ ¹
	License ownership	<i>Renewal, transfer & mergers</i>	A3.0	O	✓
	Generic provisions		A4.0	O	✓

RM	Examples
T.B.D	5
SMP	C
YES	D

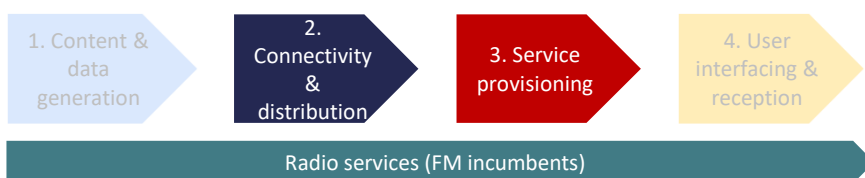
(1) For SMP companies SMP conditions apply

✓ = Standard T&C
 ✓ = Individual T&C
 ✓ = Standard T&C more relevant due to convergence in Thailand

Step 3 – Example D - FM radio (A/V)



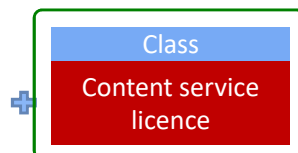
- Method
- Examples



Network facility
licence

Individual
Network service
licence

Application
service licence



A/V services

Option 1

Content provisioning	Content right	C1.0	R	✓
	Editorial	C2.0	O	
	Advertising	C3.0	R/O	
	Proper content	C4.0	O	✓
	IPR	C5.0	O	✓

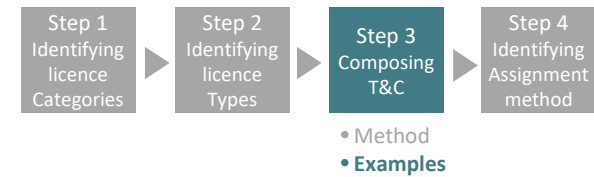
Service provisioning	Service right	S1.0	R	✓
	QoS	S2.1	O	
	<i>Service availability</i>	S2.2	O	
	<i>Technical quality</i>	S3.0	O	
	Consumer pricing	S4.0	O	✓
	Consumer Information	S5.0	O	✓
	Consumer choice	S6.0	O	✓
	<i>Price cap regulation</i>	S7.0	O	✓
	<i>Number portability, no exit charge:</i>	S8.0	O	

Admin provisions	Fees	A1.0	O	✓
	Reporting	A2.0	O	✓
	License ownership	A3.0	O	✓
	Generic provisions	A4.0	O	✓

- ✓ = Standard T&C
- ✓ = Individual T&C
- ✓ = Standard T&C more relevant due to convergence in Thailand

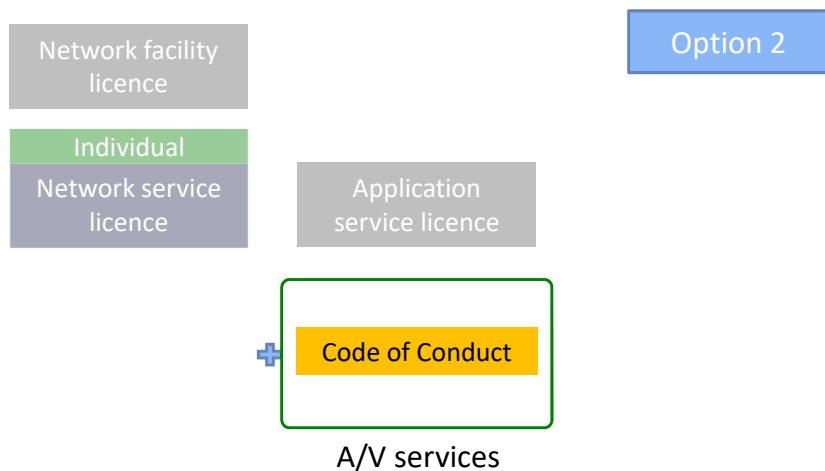
RM	Examples
T.B.D	5
SMP	C
YES	D

Step 3 – Example D - FM radio (A/V)



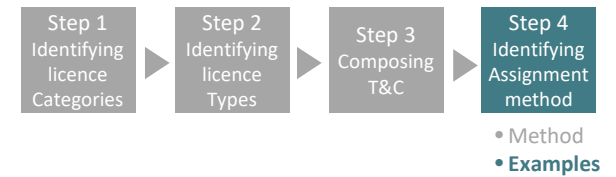
- Code of Code (for A/V services)
- NA – no licence assignment

RM	Examples
T.B.D	5
SMP	C
NO	D





Annex E: More examples Step 4



Step 4 – Example A - Telecom towers

2. Connectivity
& distribution

Telecom towers

Tower rental

Code of Conduct

Network service
licence

Application
service licence

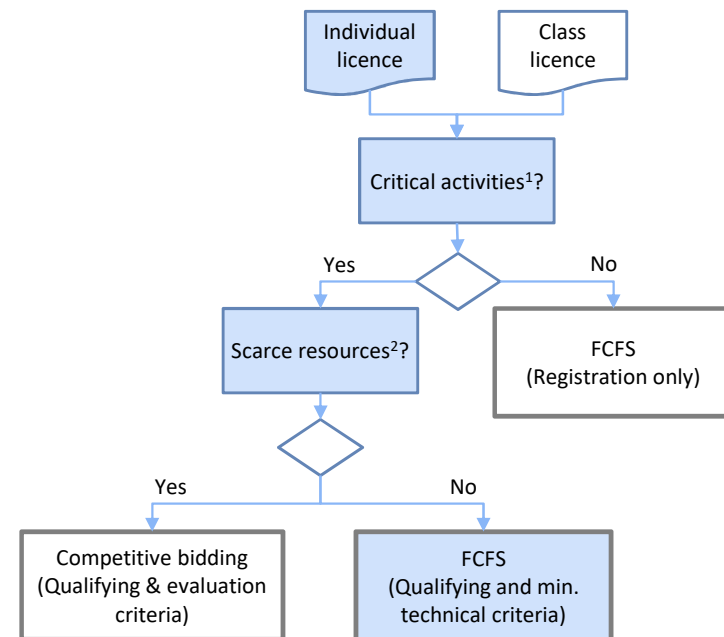
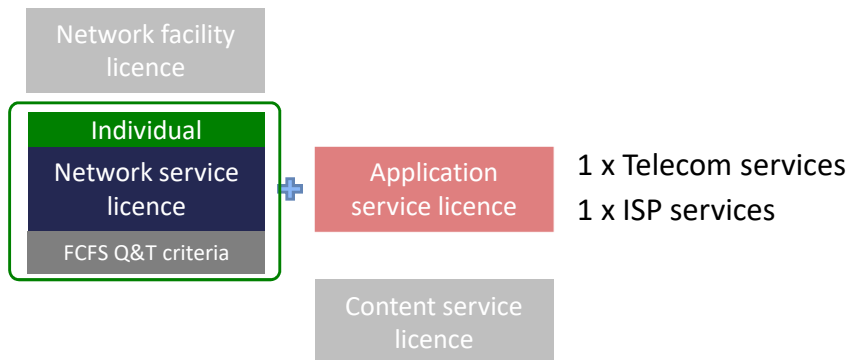
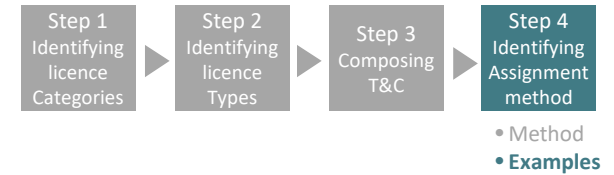
Content service
licence

- Code of Code (for tower rental)
- NA – no licence assignment

RM
T.B.D

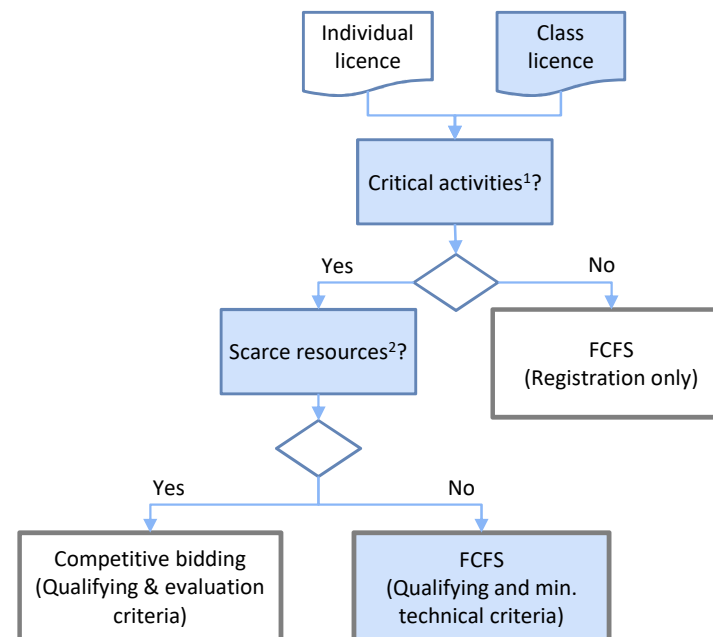
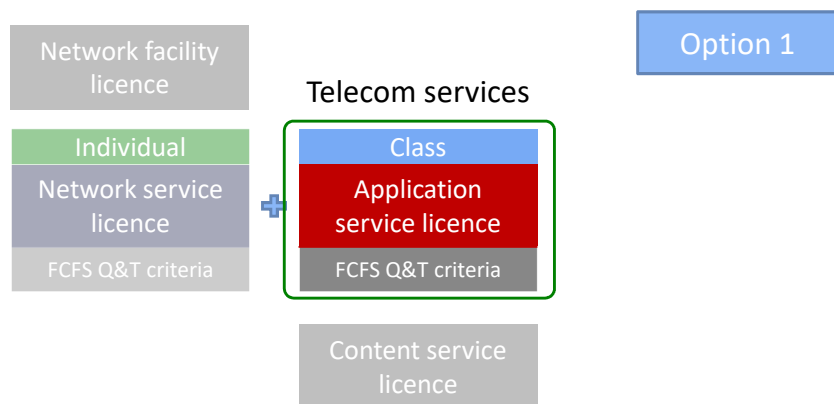
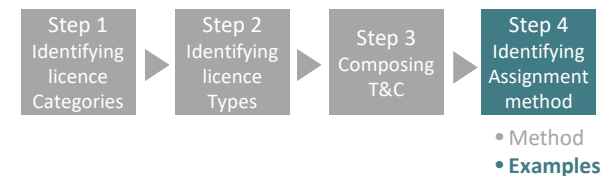
SMPs
NO

Step 4 – Example B - Fixed telecom & Internet

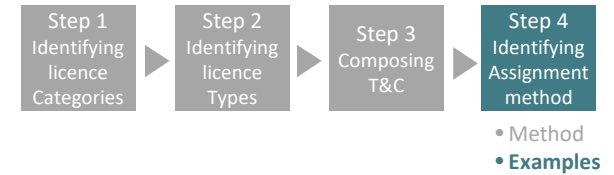


RM
5
SMPs
YES

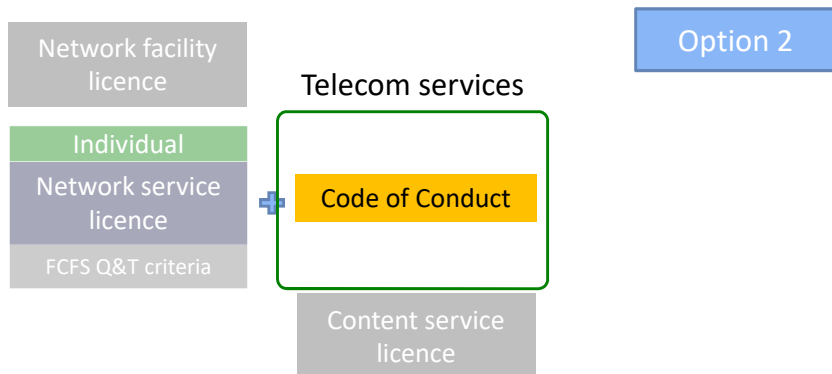
Step 4 – Example B - Fixed telecom & Internet



RM
3
SMPs
YES



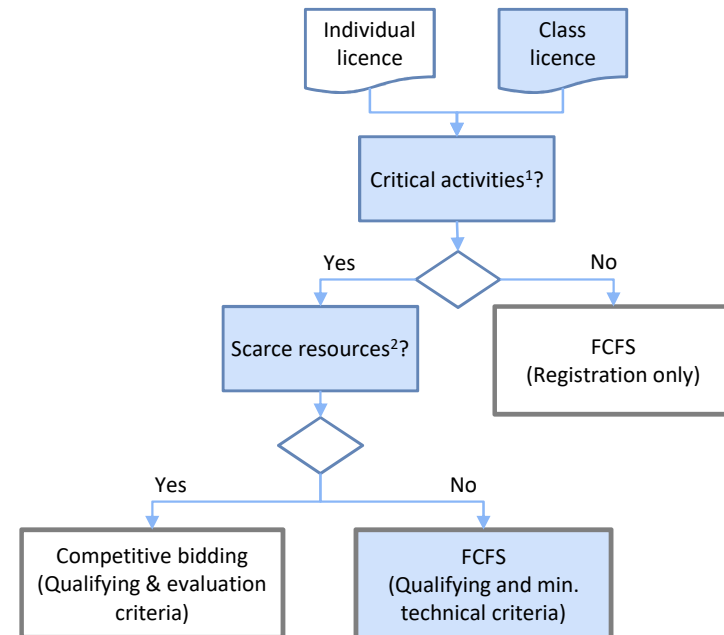
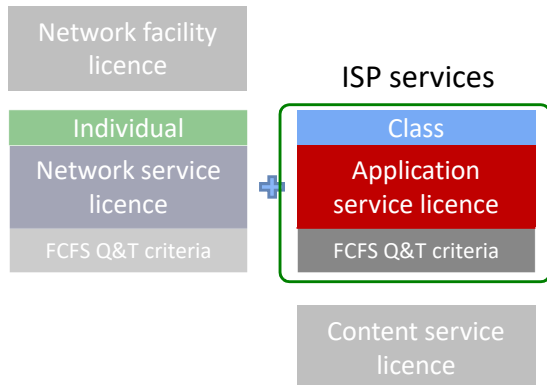
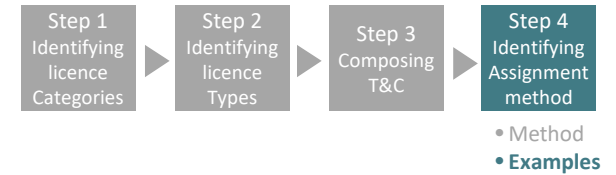
Step 4 – Example B - Fixed telecom & Internet



- Code of Code (for Telecom services)
- NA – no licence assignment

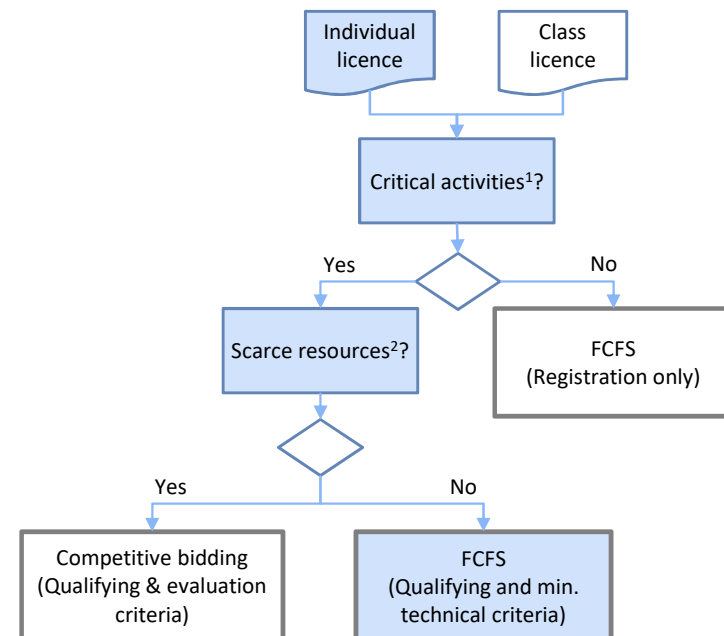
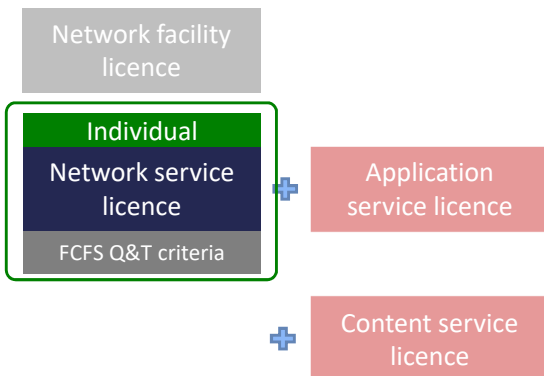
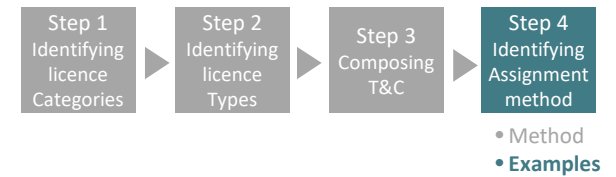
RM
3
SMPs
NO

Step 4 – Example B - Fixed telecom & Internet



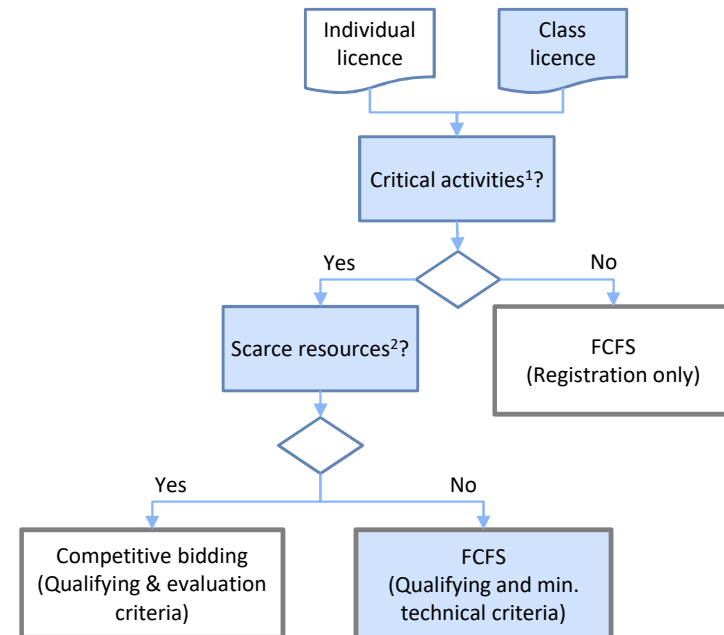
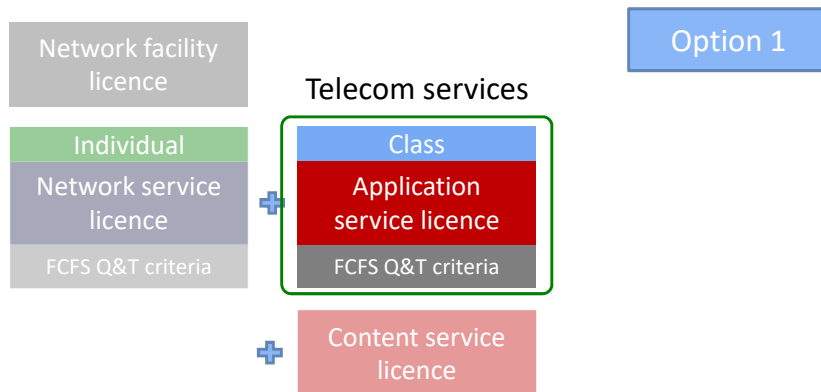
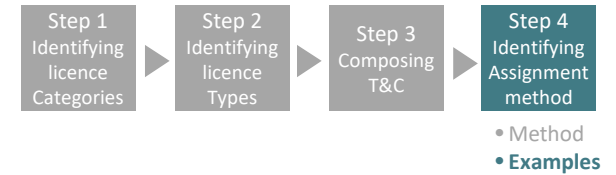
RM
4
SMPs
YES

Step 4 – Example C - Fixed telecom & A/V

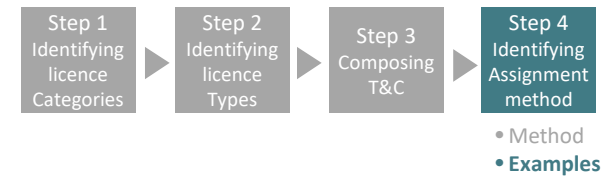


RM
5
SMPs
YES

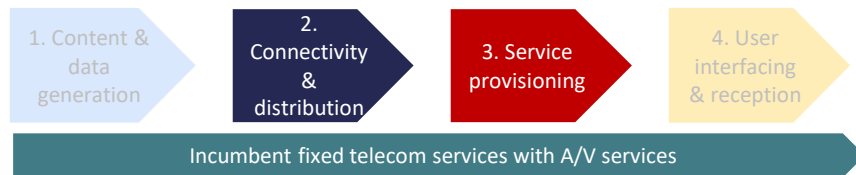
Step 4 – Example C - Fixed telecom & A/V



RM
3
SMPs
YES

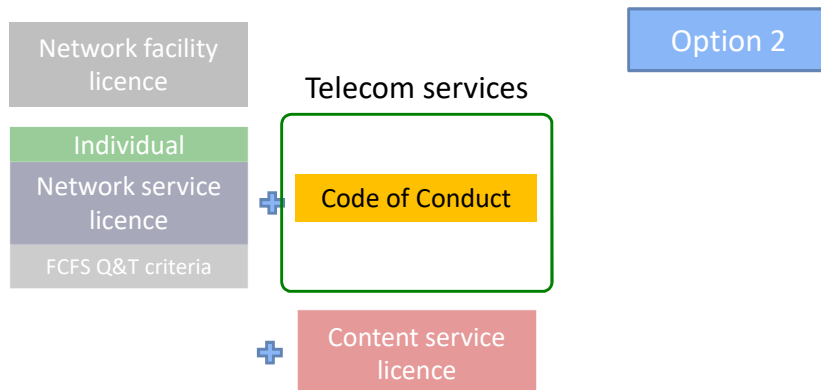


Step 4 – Example C - Fixed telecom & A/V

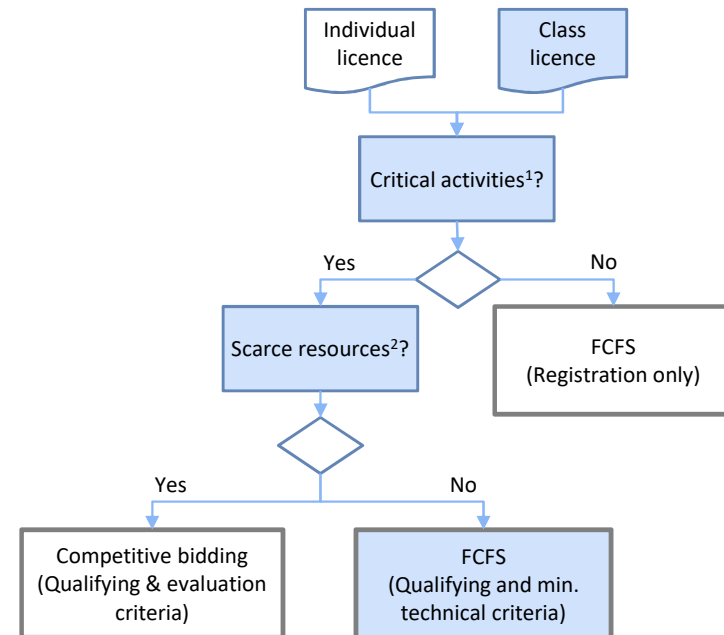
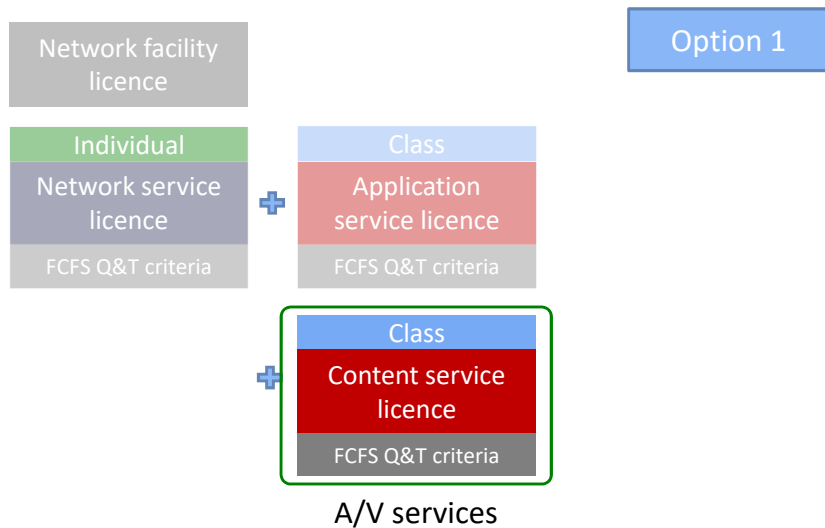
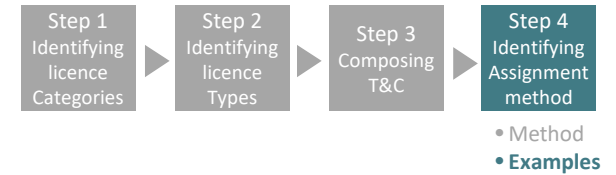


- Code of Conduct (for Telecom services)
- NA – no licence assignment

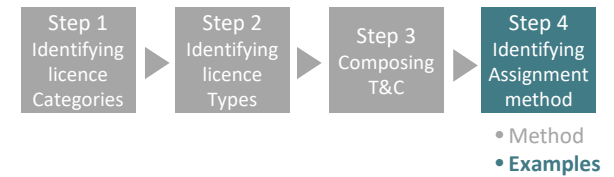
RM
3
SMPs
NO



Step 4 – Example C - Fixed telecom & A/V



RM
T.B.D.
SMPs
YES



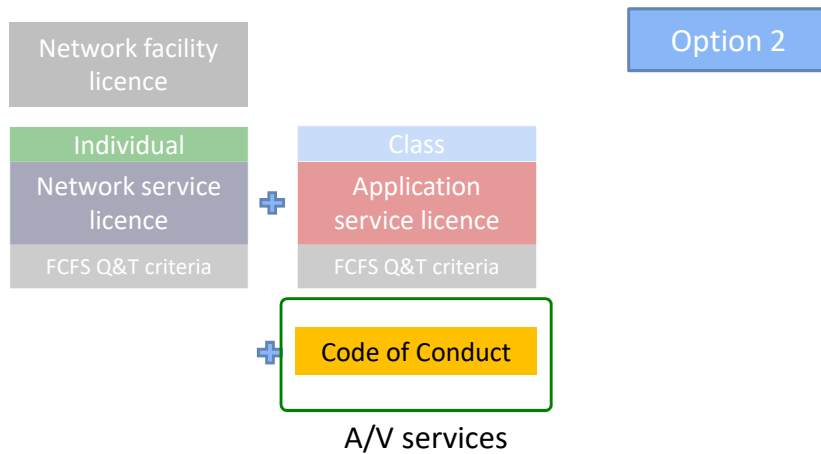
Step 4 – Example C - Fixed telecom & A/V



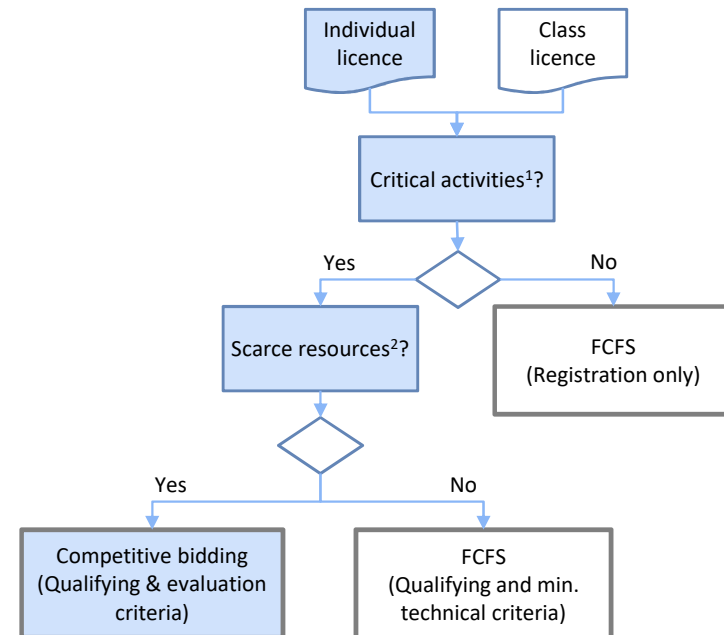
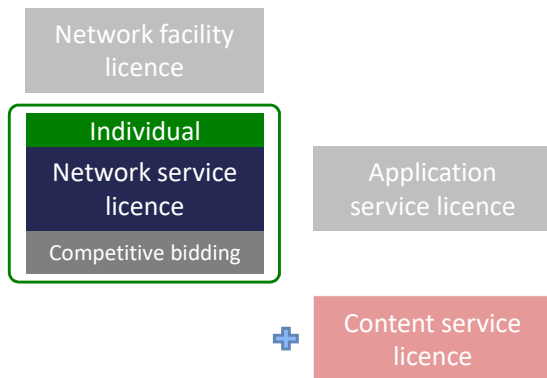
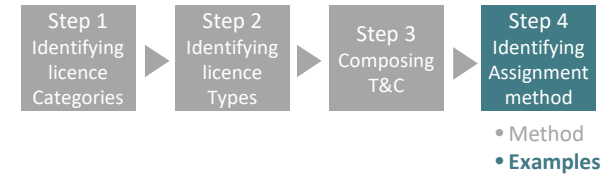
- Code of Conduct (for A/V services)
- NA – no licence assignment

RM
T.B.D.

SMPs
NO



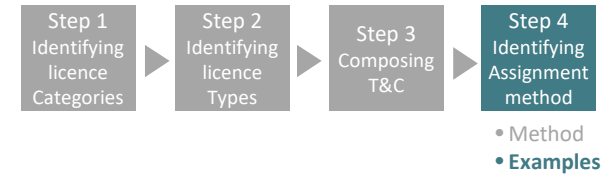
Step 4 – Example D - FM radio (A/V)



RM
T.B.D.

SMPs
YES

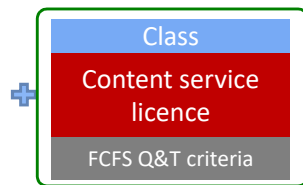
Step 4 – Example D - FM radio (A/V)



Network facility licence

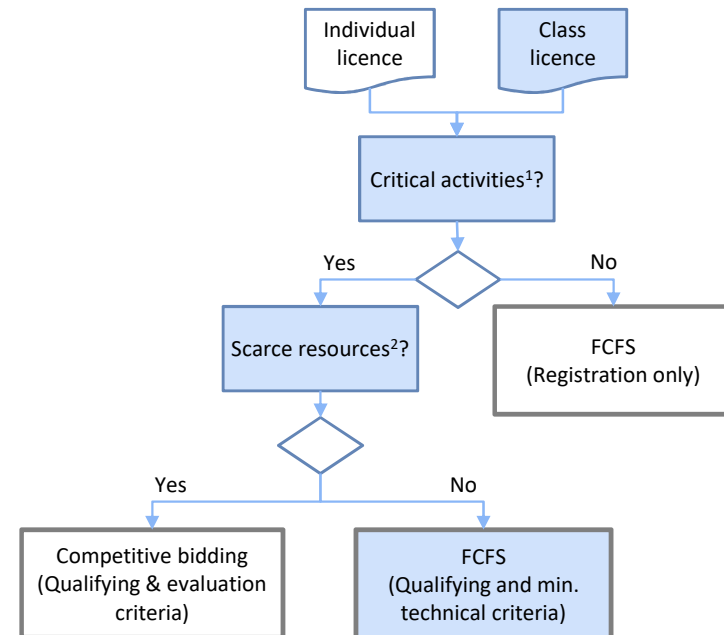
Individual Network service licence

Application service licence



A/V services

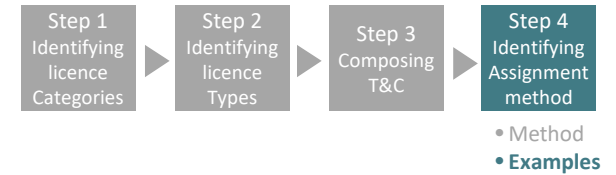
Option 1



RM
T.B.D.

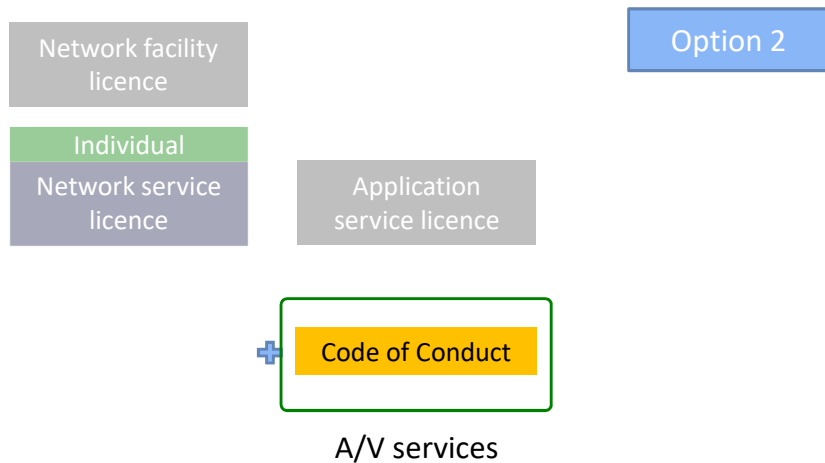
SMPs
YES

Step 4 – Example D - FM radio (A/V)



- Code of Conduct (for A/V services)
- NA – no licence assignment

RM
T.B.D.
SMPs
NO





Convergence Consulting Company ●●●

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