Regulating FTTH in Europe: the French example

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Agenda

The FTTH Regulatory framework

Transitioning from copper to fibre

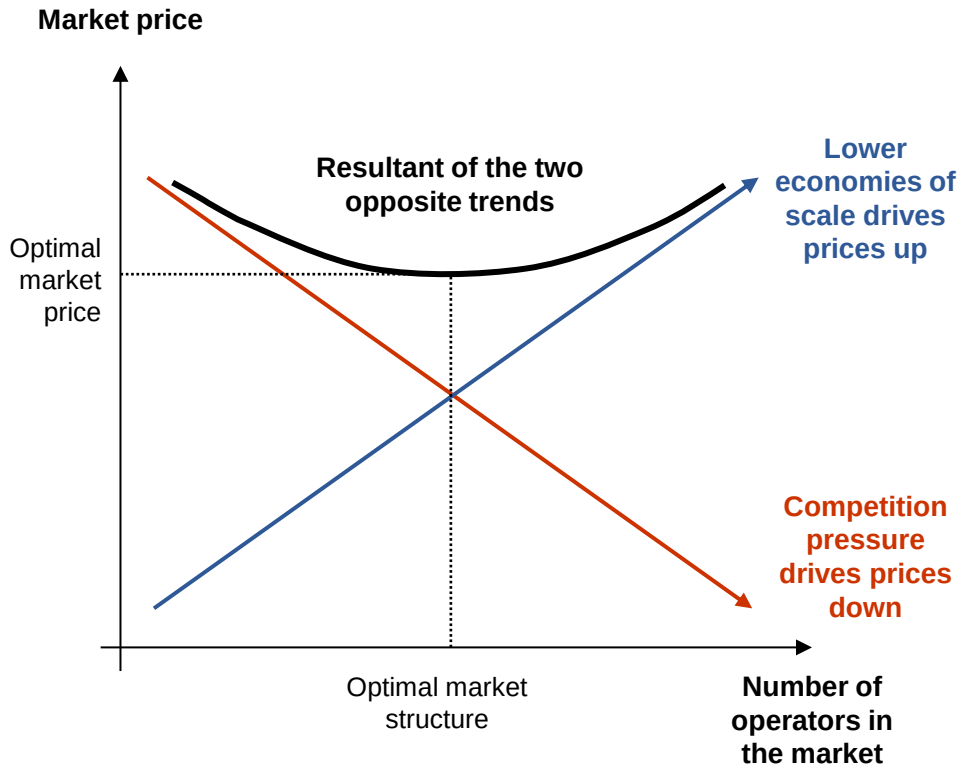
Presentation of TERA Consultants

The framework of regulatory objectives:

Incite operators to invest in infrastructure to accelerate the diffusion of services in the society

- What is the optimal market structure?
- What type of competition is desirable?
- What degree of regulatory intervention?
- To whom should regulation apply?
- How can investments in NGA and services be fostered?

General Scheme



32.9 million Living Units divided into three distinct regulatory areas

ZTD areas *(5.2M LU)*

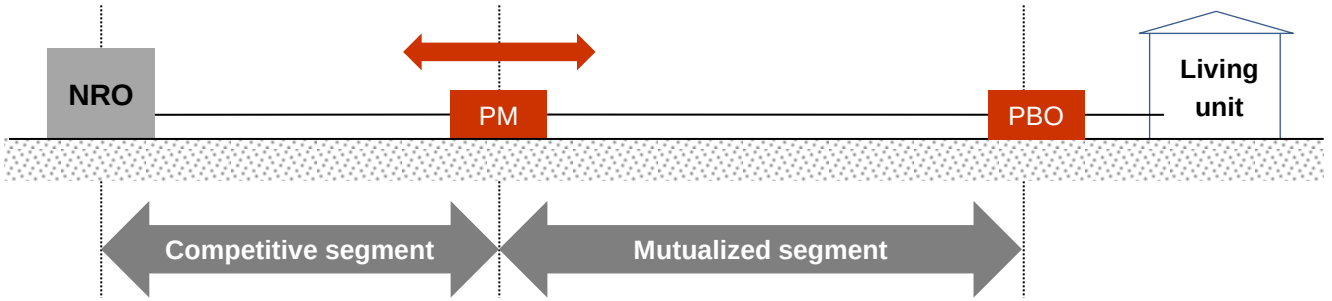
- Very dense areas
- Private investment areas
- Mainly infrastructure based competition: only the final portion of the network is mutualized
- The regulatory framework set operational and pricing rules to implement this mutualization

AMII areas *(12.2M LU)*

- Areas where at least one private operator has declared its intention to deploy FTTH
- There are private investment areas, but a greater portion of the access network is mutualized (sometimes entire access)
- The regulatory framework set operational and pricing rules to implement this mutualization

RIP areas *(15.5M LU)*

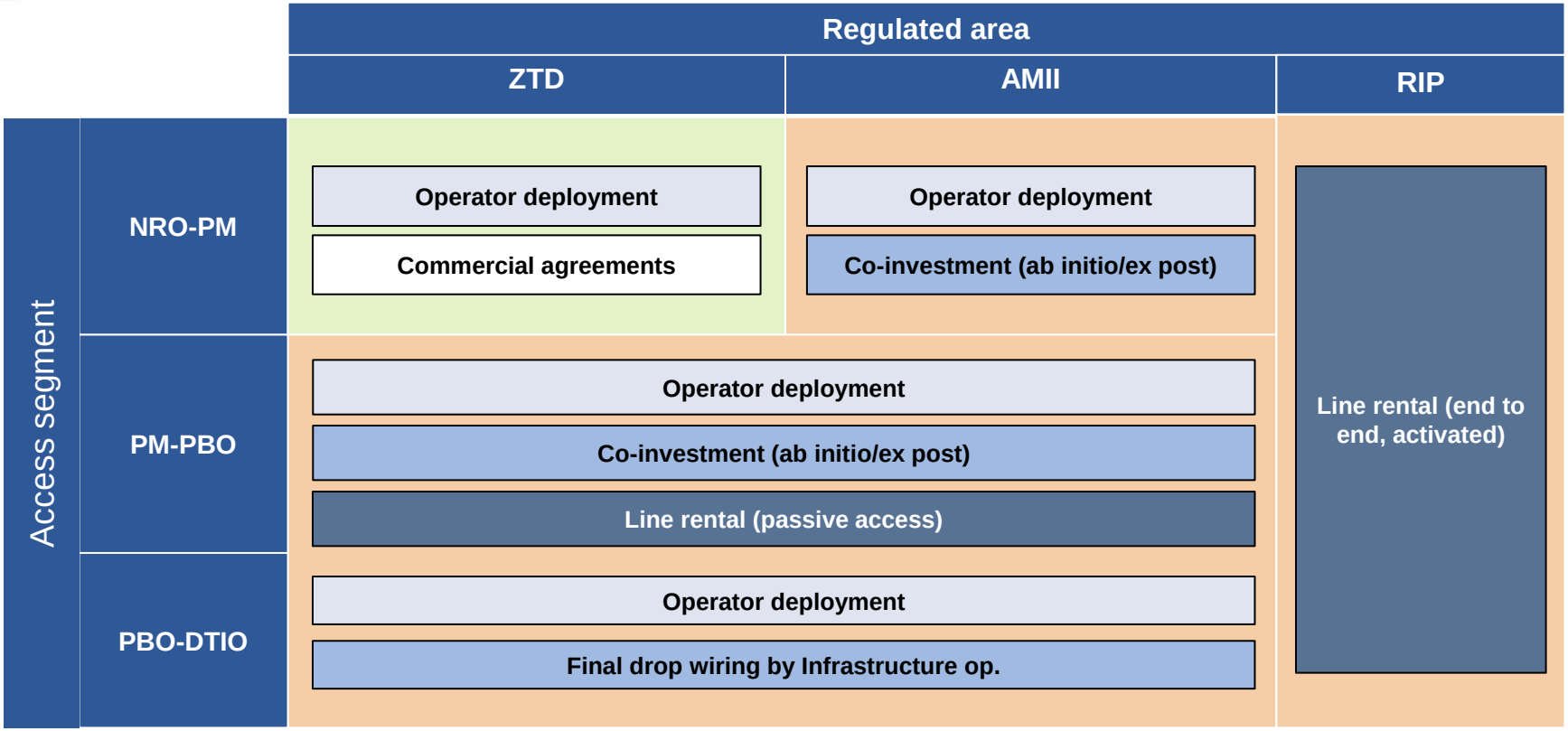
- Public investment areas
- Even a single mutualized network is not economically sustainable
- One neutral wholesale network offers wholesale products to retail operators
- The network is subsidized
- The regulatory framework set price control obligations



In all cases, between the Mutualization Point and the Living Unit, only one fibre network is deployed by an "infrastructure operator"

ZTD: high density areas ; AMII: Call for Investment Intentions NRO: Optical distribution frame PM: mutualisation point ; PBO: Optical connection point PTO: Optical terminating point

Various deployment schemes are possible depending on the regulated area and the access segment

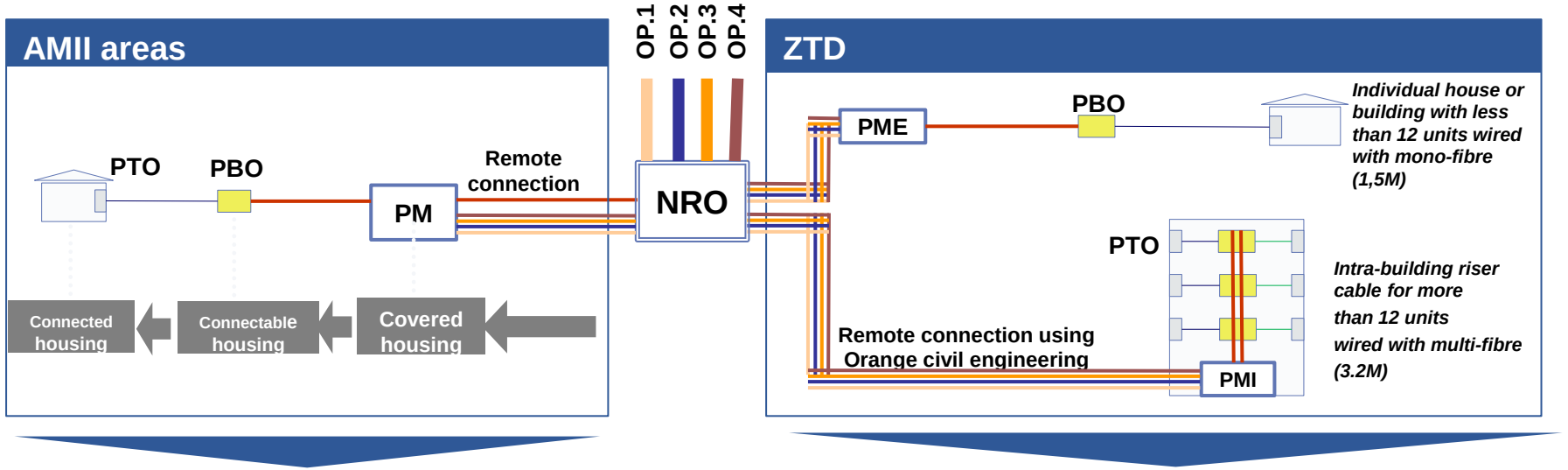


Competitive area/segment

Regulated area/segment

The regulatory framework sets specific obligations (in terms of access, network topology and price control for each regulated area x segment

Focus on private investment areas (ZTD and AMII areas)
Main operational and price control obligations



	In AMII areas	Low density sub-areas	High density sub-areas
PM Size	PM of more than 300 lines mainly in mono-fibre	PM of less than 300 lines mainly in mono-fibre	PM connecting more than 100 LU in mono-fibre for buildings with less than 12 units One PM per building of more than 12 units, in multi-fibre
NRO PM	Obligation to provide an access if the PM connects less than 1000 LU	No obligation	
PM PBO	Co-investment per tranche of 5% and/or line rental	Equal sharing (1/N) of investment costs for the shared network deployment (vertical) and/or line rental	

The operational and tariff obligation differences between ZTD and AMII strongly impact the cost/line for alternative operators

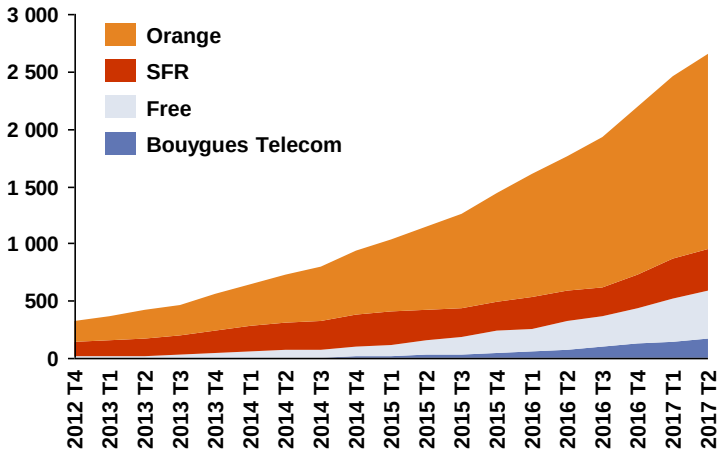
- Two effects of the regulatory differences between ZTD and ZMD:
  - the ZTD areas represent the main effort of network capillarity for only 25% of lines, since all operators must deploy up to the PM which is very close to the LU
  - the co-investment scheme (in 1/N) is less favorable for a small operator than for the incumbent: both bear the same investment, but the incumbent has a return on investment due to a higher penetration rate

➔ **Consequence: the incumbent bears a significantly lower cost per line than the alternative operator in very dense areas (impact is much lower in AMII)**

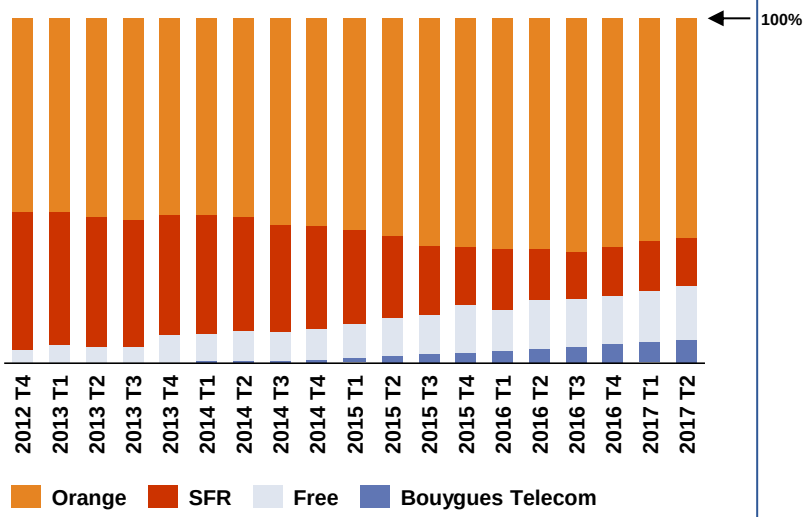
This effect is illustrated in the evolution of FTTH market shares

- The incumbent is progressively consolidating its dominant position on the FTTH segment

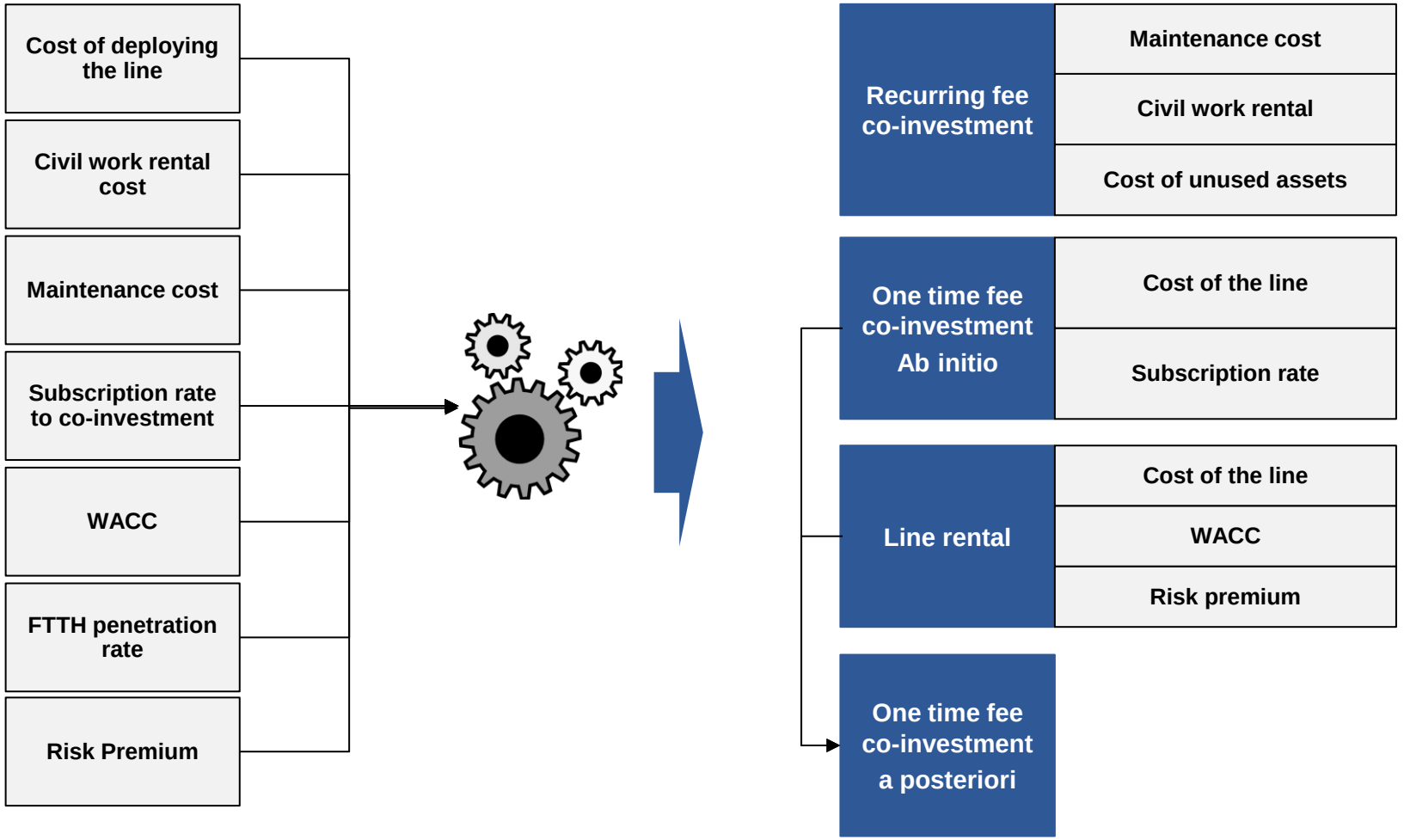
FTTH Customer base per operator



FTTH market shares



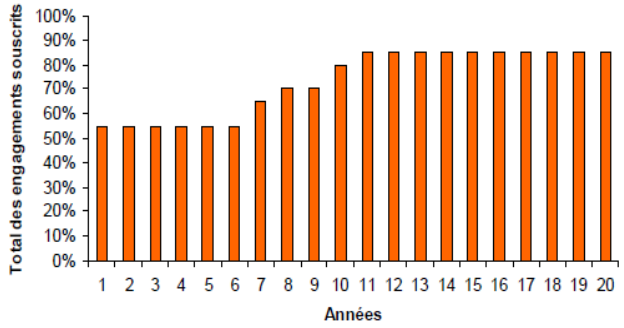
The construction of access tariffs is complex, but ensures consistency between the different access schemes (co-investment ab initio, a posteriori, line rental)



The construction of access tariffs is complex, but ensures consistency between the different access schemes (co-investment ab initio, a posteriori, line rental)

Recurring fee co-investment	**Maintenance cost**
	Civil work rental
	Cost of unused assets
One time fee co-investment Ab initio	**Cost of the line**
	Subscription rate
Line rental	**Cost of the line**
	WACC
	Risk premium
One time fee co-investment a posteriori	

- The cost of unused assets (« stock cost ») covers the financing cost (debt and equity) required to cover the co-investment tranches which will not be subscribed by a co-investing operator.
- If co-investors subscribe to 100% of the investment, this cost component is null. This is always the case in very dense areas where the co-investment mechanism is in 1/N, meaning that in all cases, the investment is subscribed.
- Will disappear with copper's extinction (full use of FTTH network).
- Orange published the hypothetical subscription rates used to calculate the reserve component in its reference offer



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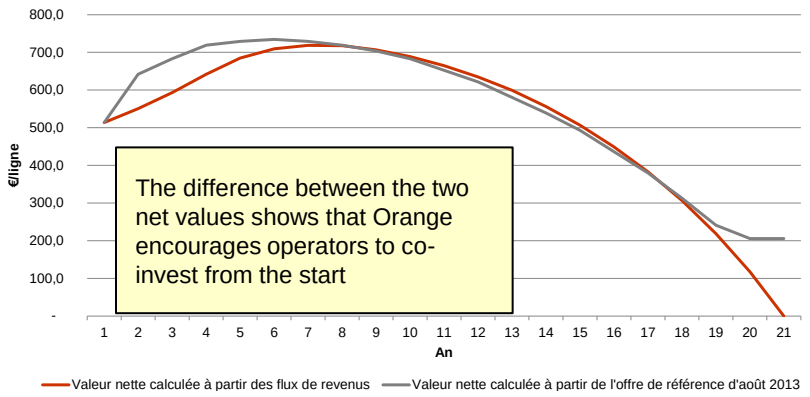
One time fee co-investment a posteriori	

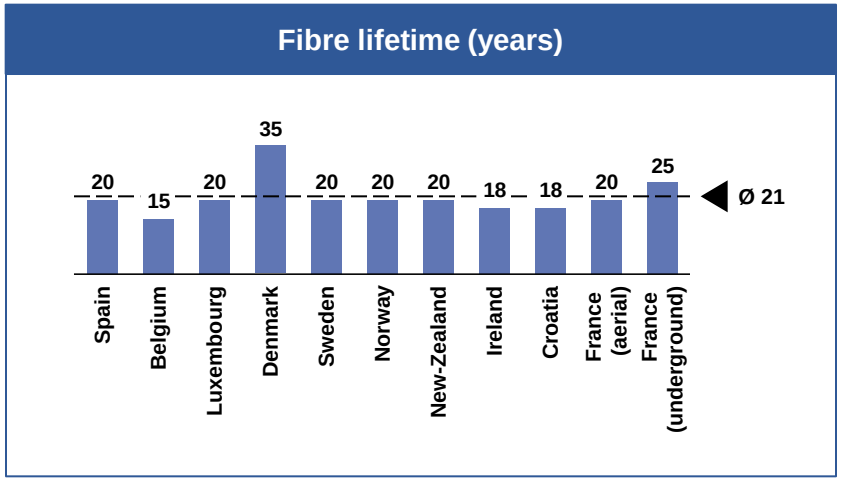
- The ex-post coefficient must be set so that investing *a posteriori* is no less expensive than investing *ab initio* (but with risk premium).
- To achieve this, the economic net value of an *ab initio* co-investment operator must be equal to Orange's co-investment *a posteriori* tariff each year. Net economic value is defined as the sum of the discounted income generated by an asset.

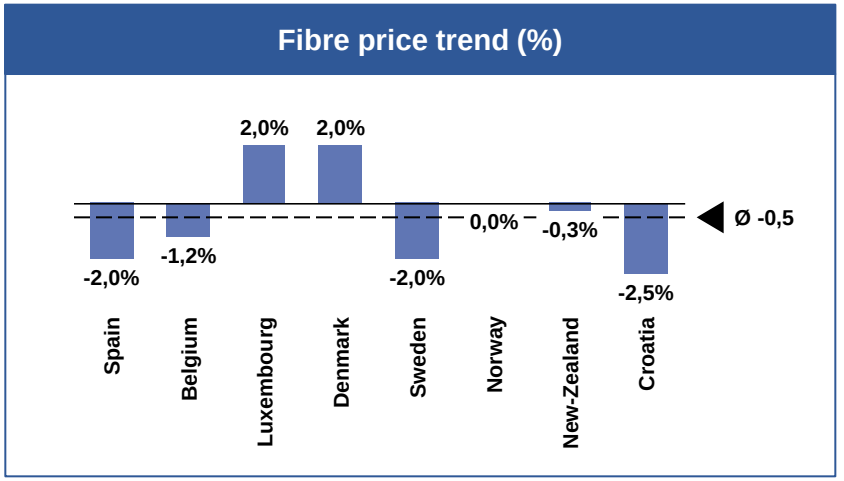
Comparison between the one time component of ex-post co-investment and the net economic value of the line



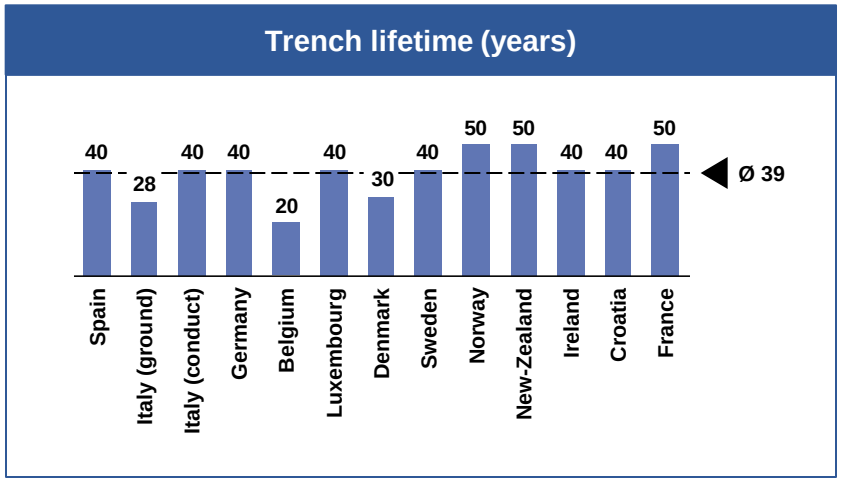
Other elements impacting the costs (and therefore the tariffs): asset lifespan and price trends

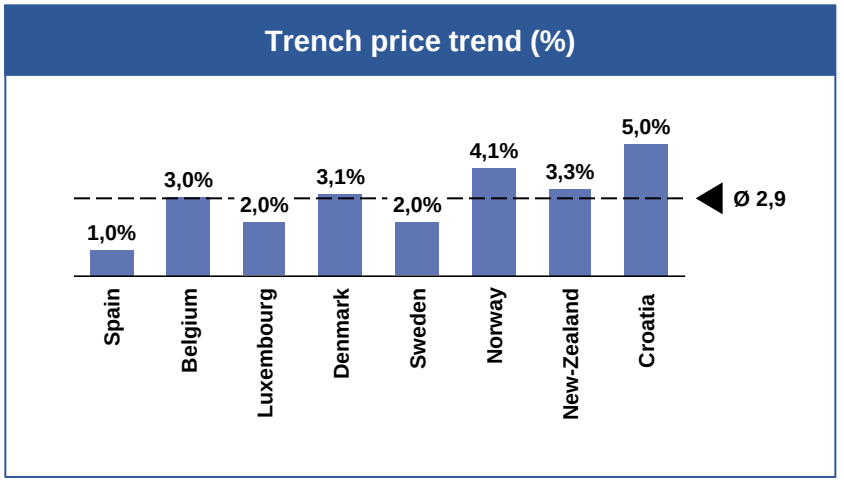
Example 1: the fibre cable





Example 2: the trenches

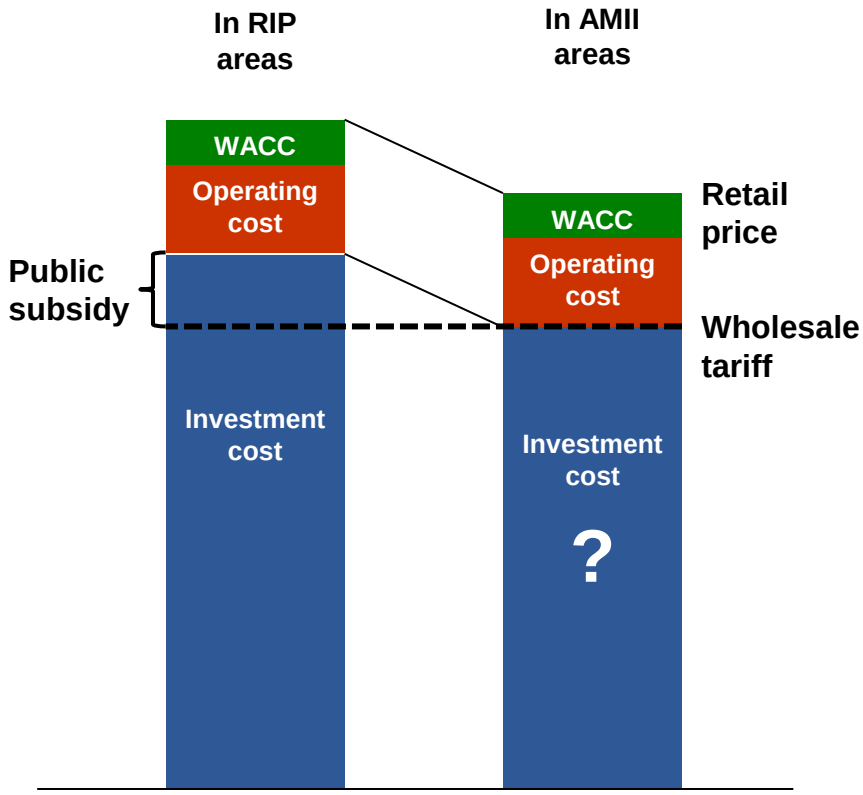




Focus on tariffs in public investment areas

- Access tariffs for public initiative areas must be “in line” with tariffs practiced outside of very dense private initiative areas

- ARCEP published recommendations for infrastructure operators in RIP areas providing flexibility during the first years to foster subscription rates



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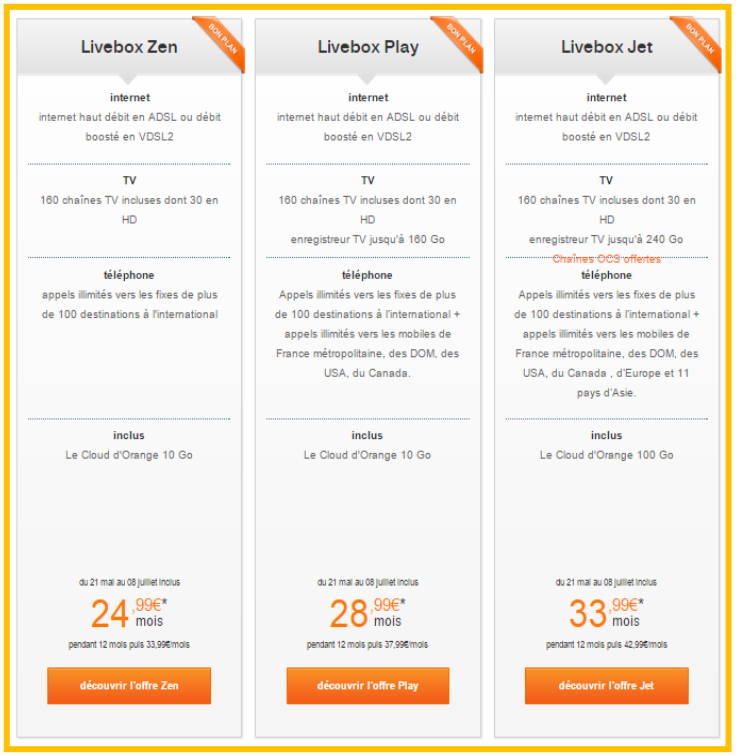
In France, quadruple play offers based on Fibre and Copper are basically at the same retail tariffs (sept. 2017)

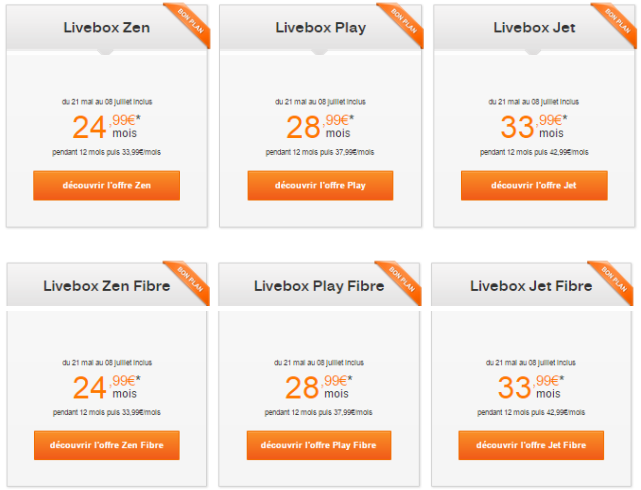
Orange 4P copper-based retail offers

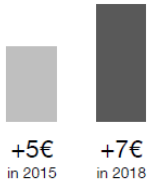


Orange 4P fibre-based retail offers

By launching a €29.99 offer in 2002, Free eliminated all possibilities of differentiating rates on a new technology based on a better quality of service

However, the difference between the wholesale price of FTTH and copper unbundling remains very high





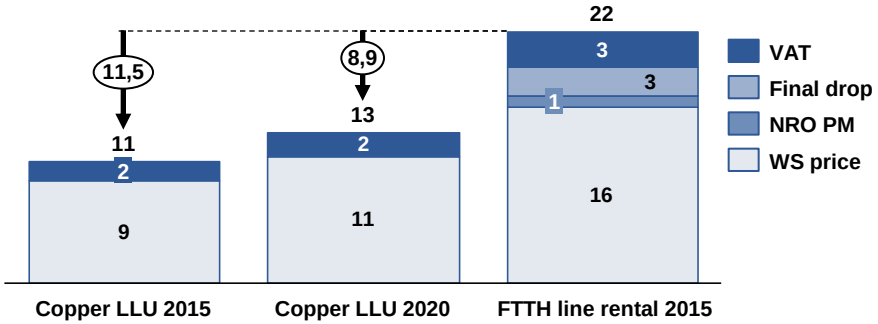
ARPU uplift of FTTH vs. ADSL customers

- ADSL and FTTH retail tariffs are generally aligned
- Average FTTH ARPU is 5 to 7€* higher than Copper, because of value added services (VoD) with ~30% margin**, meaning additional ~2€ for operator

A 7€ (incl Tax) gap to be filled ?

Wholesale tariffs

- € /line/month -



- An approx. 9€ gap between fibre and copper wholesale price by 2020

**Orange strategic plan essentiels 2020
*** CNC, L'économie de la VoD en France
****Plan France Très Haut Débit

The « accelerated migration area » aims to speed-up copper network switch-off for a rapid migration to fibre

Past framework

- Copper: an essential facility since 2004 because the incumbent, France Telecom, was in a monopoly situation.
- Access obligation to the local loop + cost orientation of wholesale local loop unbundling tariffs, and equalization at the national scale level.
- Access tariffs calculated based on the method of current economic costs (Tilted annuity) ➔ Sends a signal of resource usage.
- LLU tariff*: 9.1€/month in 2016; 9.45€/month in 2017.

The new regulatory framework in project

« the duplication of the copper network by another infrastructure opened to a part of the territory may require to modulate geographically, tariff remedies*, in particular regarding the monthly recurring tariff of regulated wholesale offers, in order to adapt the tariff regulation of access to the local loop copper to competitive conditions.* »**

Accelerated migration areas (ZMA) **Relaxing price control obligations**	***In the rest of the territory (outside ZMA)*** **Cost orientation remains**
• **Obligation of non-excessiveness (tariff pay or play), the increase of tariffs must be reasonable.** • **Obligation of non-discrimination by territory within the ZMA.** • **The establishment of a mechanism ensuring that Orange respects the obligation of non-excessiveness in ZMA ***	• **maintaining the legacy regulatory framework**

**** pluri-annual price cap, ARCEP Decisions n° 2016-0206, n° 2016-0207 and n° 2016-0208 in 16 february 2016.***

***** ARCEP. Public consultation project, 23 june 2016.***

******L'ARCEP did not precise so far any particular ceiling.***

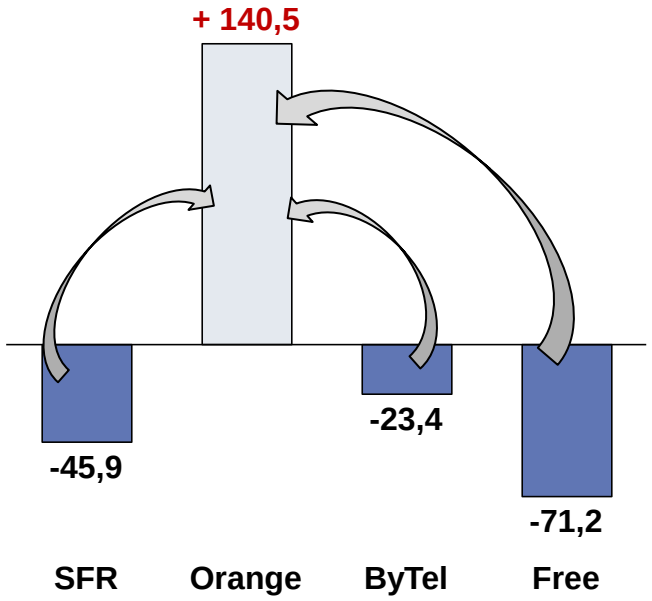
Operational criteria to define those ZMA are still under discussion

Criteria	Implementation
1. Comple deployments	• Measured by the rate of connectable access to the optical fibre infrastructure. ➔ *What threshold?* Not specified at this stage
2. Availability of diversified wholesale offers	• Existence of various passive wholesale offers on the optical fibre network allowing to face residential and business needs (offers with high QoS). ➔ *What about active offers (especially for B2B operators)?* Not specified at this stage
3. Operational nature of the network	• The definition of a minimal penetration rate ➔ *What is this minimal rate?* • The publication of QoS indicators by the infrastructure operator ➔ *What indicators to retain ? How to set thresholds?* Not specified at this stage
4. The minimum size and the relevant scale to define ZMA	• The minimum size of the ZMA : defined based on the minimum number of connectable lines • The minimal relevant scale of ZMA : the zip code, the INSEE code, the area downstream the NRA, etc. ➔ No answers to these questions at this stage.

This approach could give financial revenues to the incumbent without supplementary charges…

Impact on the EBITDA of a 1€ LLU increase without pass-on retail tariffs

- M€ / year -



Estimation based on a 9.05€/line tariff, after migration of SFR customers on cable network (25% of SFR customer base)

Estimation based on operators' 2015 customer bases

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TERA Consultants

- Founded in 1996, TERA Consultants provides clients with economic and strategic expertise in 4 key areas:
  - Sector-based regulation
  - Competition (cartels, mergers, dominant position)
  - Litigation and damages
  - Cost and margin management and strategic planning

- We provide advisory services and assistance for all types of clients: from large sized companies down to the very small, for the private sector and public sector including regulatory bodies or other administrations in various economic sectors: network industries (telecommunications, Internet, energy, postal services, railway,…), banking, retail,….

Regulation:
missions carried out (1/2)

- Interconnection, interoperability, access and unbundling
  - Assessing Value Added Voice Services in interconnection services
  - Developing bottom-up cost models for network access in unbundling
  - Assisting clients implement CMILT or CILT cost models
  - Analysing an operator's current costs to regulate interconnection tariffs
  - Evaluating the value of an access to railway infrastructure
  - …
- Universal Service or general interest services
  - Undertaking a Universal Service cost model in telecommunications
  - Carrying out the economic analysis of funding mechanisms in broadcasting and movie production
  - Analysing the selected allocation key to apply to Universal Service charges and cell phone operator contribution
  - Assessing the cost of Universal Service in telecommunications in a European country
  - Evaluating Universal Service obligations in telecommunications in a European country
  - …
- Call for tender and auctions
  - Drafting answers for operators' bids or auction bids for licenses
  - Preparing a candidate to audition for a local loop radio license
  - Providing expertise to the regulatory authority for cellphone license auction procedures
  - Defining procedures to attribute public markets
  - Implementing calls for tender and consultations to attribute broadcasting rights
  - …

Regulation:
missions carried out (2/2)

- Accounting separation
  - Drafting a methodology to allocate costs between regulated and competitive activities
  - Defining the allocation keys in fixed costs and common costs for a broadcaster
  - Separating costs for a postal service's exclusive and competitive rights businesses
  - Evaluating cross-subsidies between regulated and non-regulated activities for a telecommunications operator
  - Assessing public service costs and non regulated public service broadcasting
  - ...
- Cost modelling
  - Cost modelling of local loop, mobile and fixed and mobile core networks
  - Assist the regulatory authority in setting up CMILT cost models to control interconnection tariffs
  - Audit cost calculation models for Universal Service
  - …
- Regulated tariff offers
  - Modelling tariffs for call termination on telecommunications' operators (fixed and cellphones)
  - Defining the "price cap" for regulated tariffs
  - Providing arbitration assistance for operators' interconnection tariffs
  - Analysing how changing calculation methods impacts pertinent costs of regulated tariffs
  - …

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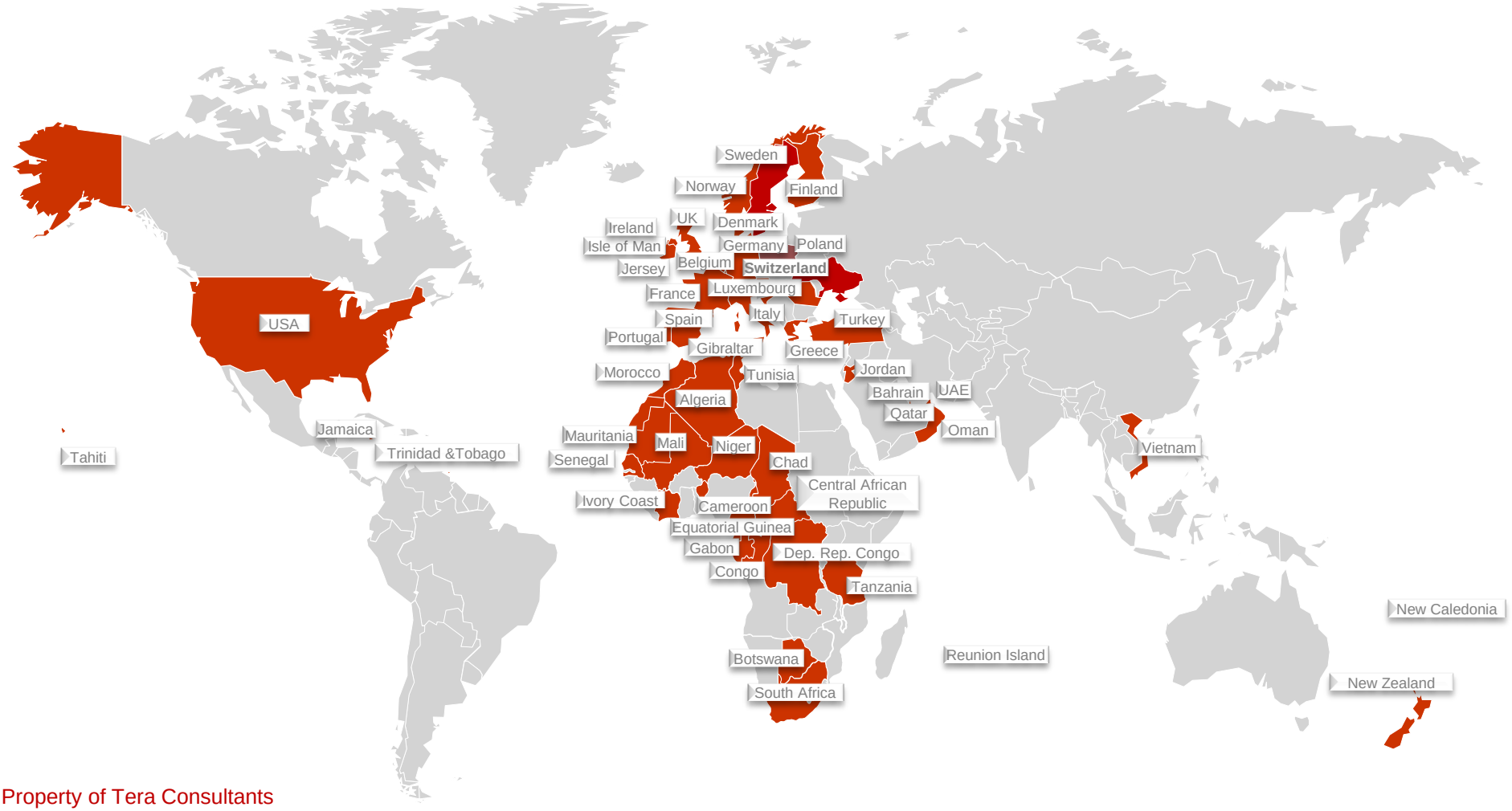
A worldwide footprint

Operators and regulatory authorities solicit the recognized technical and economic skills of TERA Consultants on regulatory issues. TERA Consultants has a strong track record providing advisory services in regulation to clients in more than 50 countries worldwide.



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