



Luxembourg's national 5G strategy and implementation

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5G in Luxembourg

- 2018 5G Strategy
- 2019 5G Call for Projects
- 2020
 - Auction: Licenses were awarded (700 and 3600Mhz) – Four players
 - 5G service is lit on by Post, Proximus
 - Consultation on 26GHz auction
- 2020 -2021 5G Implementations
- 2021 Set up of the national and pan-European eco-system

5G implementation

5G
Strategy

5G call
for
Projects

Auction

5G
ecosystem

Luxembourg Business Case

Focus on niches that the required capabilities are not readily or cost effectively met by alternatives.

Facility Manager

- Rent space
- Rent facilities (lampposts, street cabinets, stadiums etc.)

Infrastructure Owner

- Datacenters
- Cloud
- ...

Neutral Host Operator

- Provide wholesale access
- Smart pipe
- Optimize performance
- Partnerships

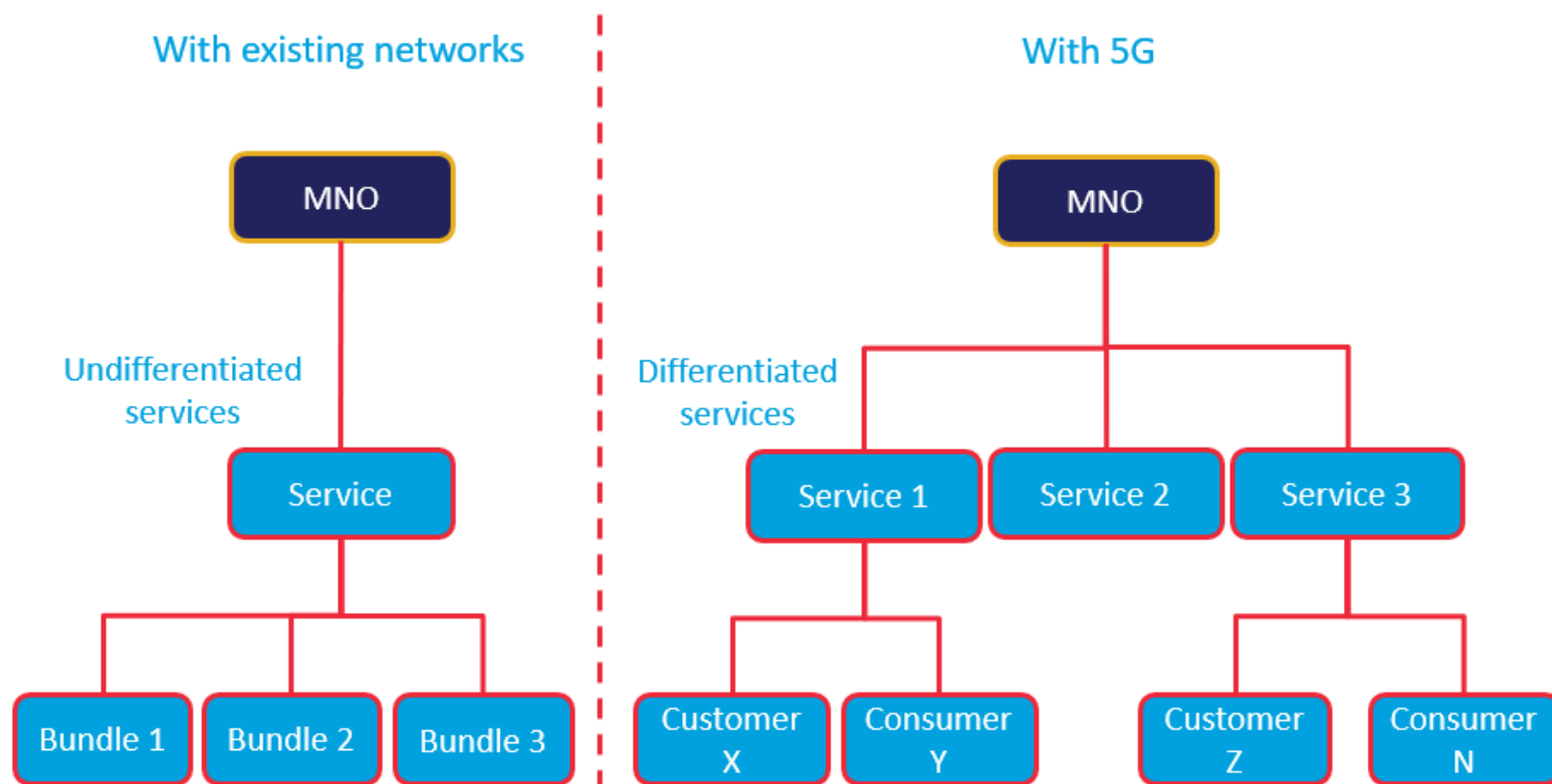
Service / Content Provider

- Differentiation
- Tailor-made personalized services
- Meet clients requirements

No killer application – No massive deployments are expected – 5G islets

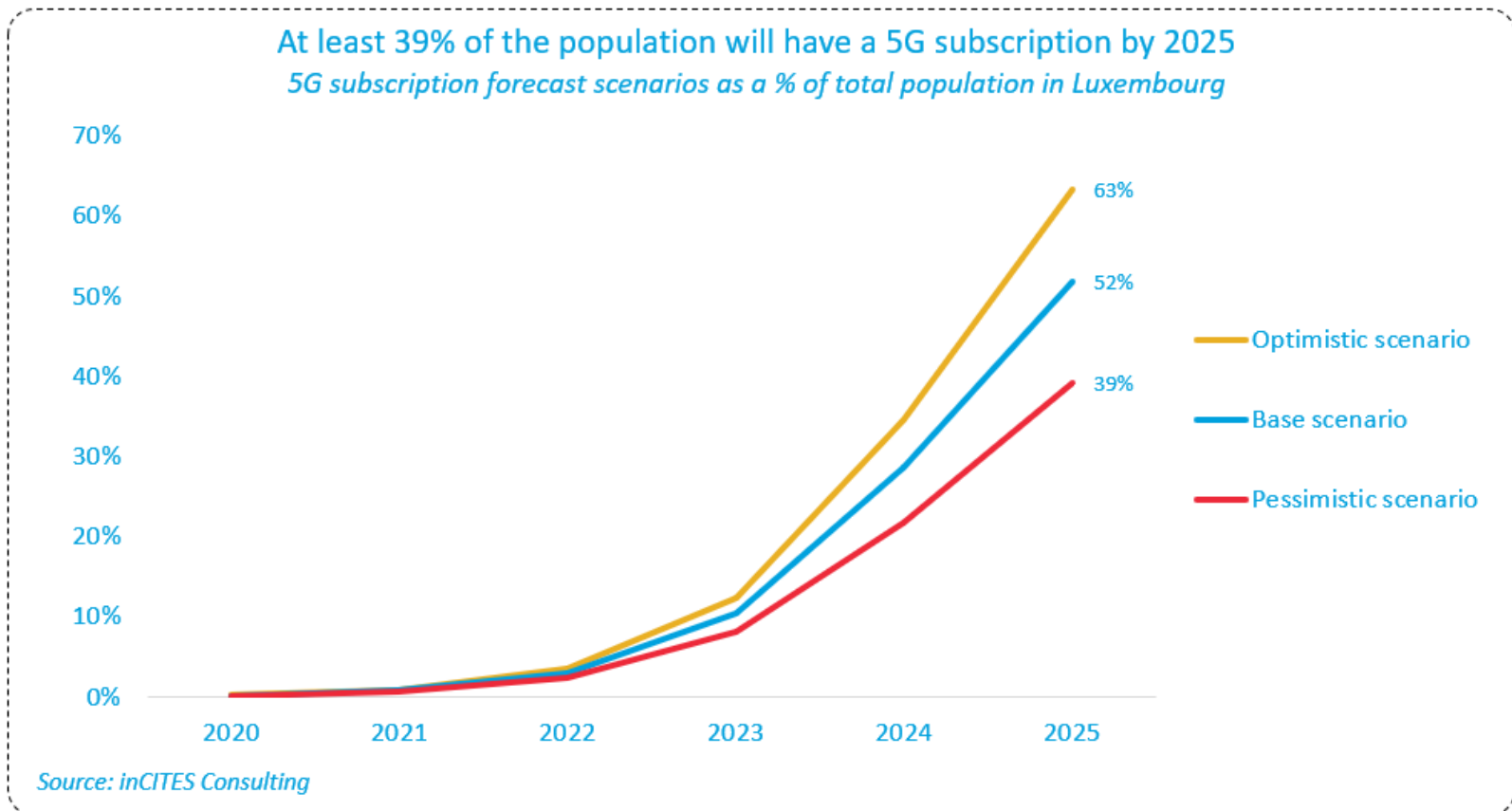
5G Business Model

- Service provisioning will enable various new business models in the 5G era



5G Forecasting

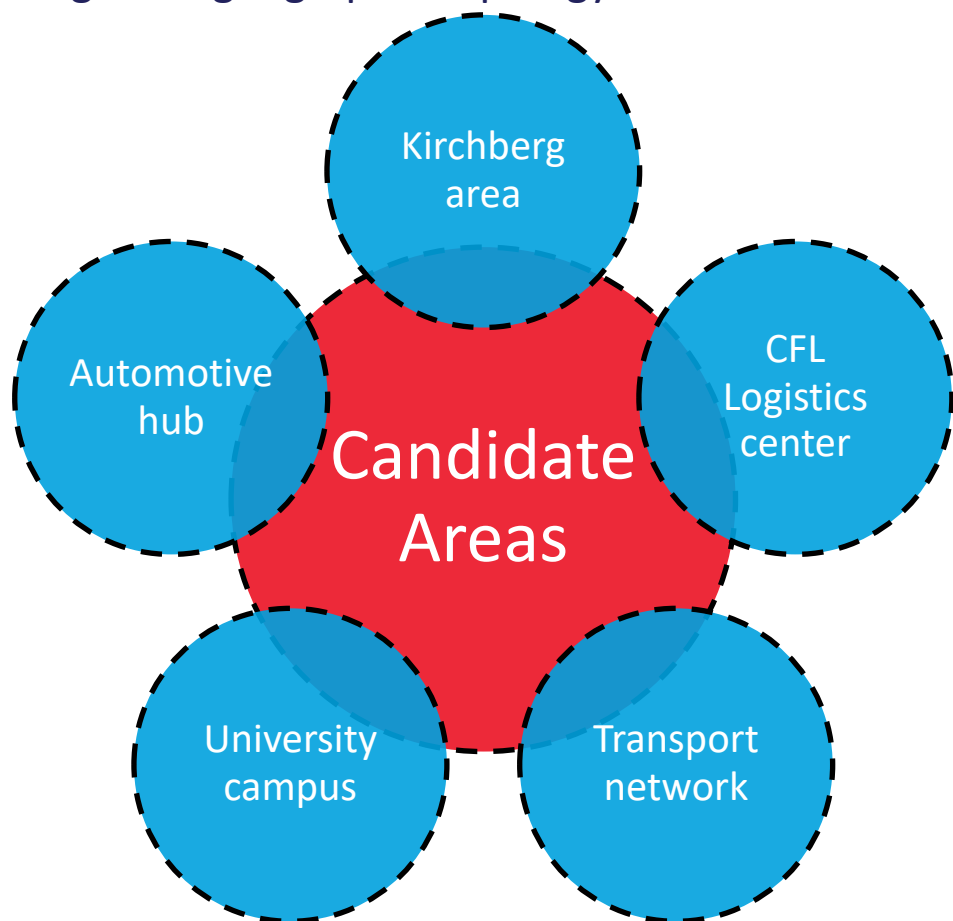
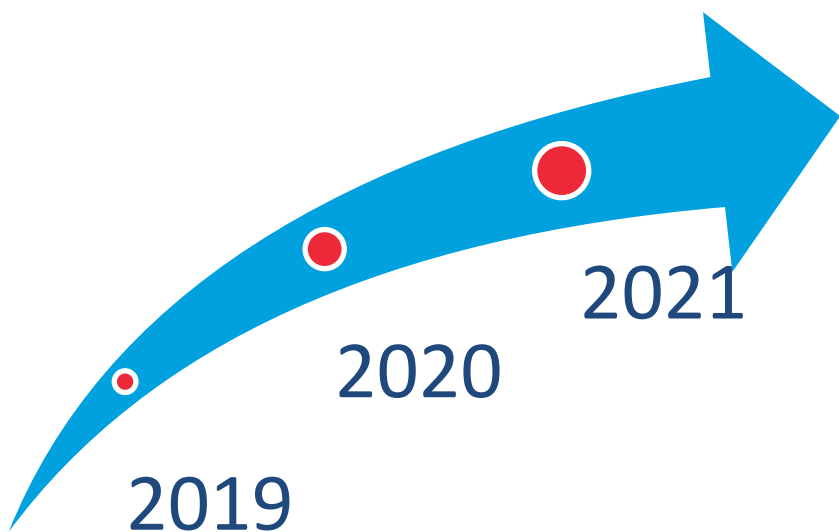
- Luxembourg needs to leverage its strong digital assets to realise the potential of 5G



Luxembourg 5G Pilots

- The pilots vary both in sector coverage and geographic topology

30M€ co-funding

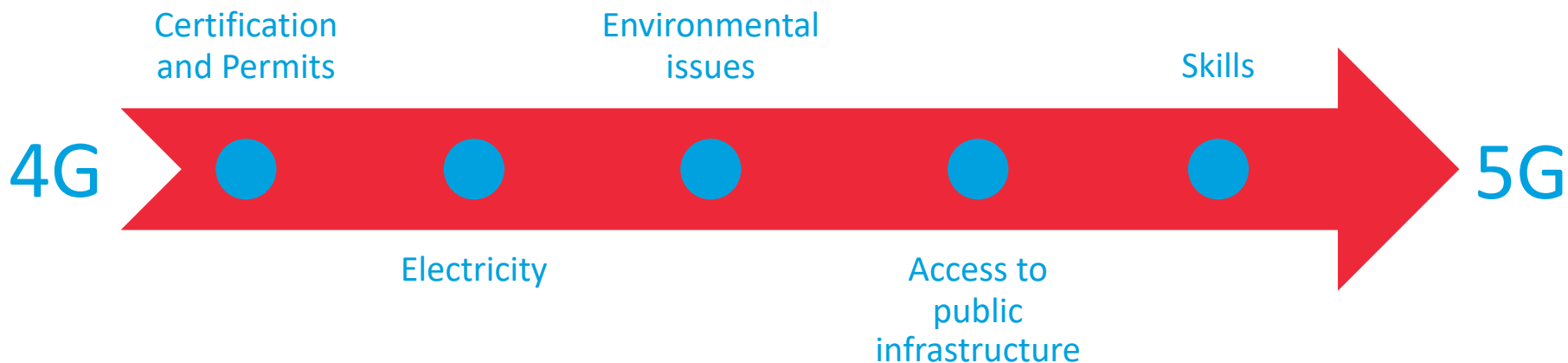


Current market status

- ✓ Extensive fibre network
- ✓ State-of-the-art data centers
- ✓ Government willingness to provide incentives
- ✓ Role of satellites
- ✓ Regulatory framework

5G Deployment Barriers

- Proactive regulation will be crucial to alleviate concerns across all network phases



Recommendations

- Facilitate the timely availability of spectrum
- Provide incentives for investments in 5G
- Process simplification that reduces administrative complexity
- Facilitate the reduction of incurred costs
- Alleviate public concerns
- Address any environmental considerations
- Increase the availability of sites with power and backhaul

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5G Call for Projects

- Launched in June 2019
- 28 proposals submitted
- 27 proposals retained for grant negotiation
- EMF, agriculture, health, security, constructions, logistics, transport, media, tourism, industry 4.0, public safety
- Autumn 2020 – kick off of first projects

5G Projects – Objectives (1/2)

- Test the provision of innovative and reliable services to end-users over 5G in terms of speed, latency, quality of service and other network characteristics.
- Gain experience with the deployment of 5G networks and the implementation of 5G driven services, facilitate the identification of any obstacles or bottlenecks and the research and testing of appropriate solutions.
- Optimize the impact of the 5G network by enabling synergies between various projects, e.g. by hosting several projects within a same pioneering zone.
- Involve socioeconomic drivers (e.g. schools, universities, research centers, transport hubs, hospitals and administrations).

5G Projects – Objectives (2/2)

- Foster 5G entrepreneurship by acknowledging the opportunities 5G technology offers and turn them into products and services that have a positive impact for Luxembourg.
- Encourage innovation and market competition.
- Encourage and facilitate new and existing network service providers to choose and implement their own strategy with respect to possible private investments in these areas.
- Test innovative applications using technologies that can be substitutes and/or complements to 5G.

5G Projects - Scope

- Project applicants need to specify:
 - the technical network used and
 - the network operator willing to invest in and/or operate the required infrastructure that the project relies on.
- Projects will have a minimum duration of 6 months and a maximum duration of 24 months.
- A maximum of 80% of co-funding cannot be surpassed
- The network supplier of the selected projects will have to obtain the relevant right of use of radio frequencies:
 - either by requesting test frequencies or
 - by being awarded a regular license.
- Projects have been carefully evaluated by an international experts committee and a final Review has been performed by an inter-ministerial 5G Commission

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Auction (1/3)

- ILR launched a public consultation on the use of 700 MHz and 3.4-3.8 GHz frequencies for 5G from August to September 2017 and from May to July 2019.
- ILR launched a public consultation on the “Allotment and Allocation Plan for Radio Frequencies” from June 2018 to July 2018.
- 700 MHz and 3.4-3.8 GHz frequencies auction was carried out on July 2020.
- A public consultation on the use of 26 GHz frequencies for 5G will start soon.

Auction (2/3)

- In 700 MHz frequencies, players cannot get more than 2×10 MHz. In 3400-3800 MHz frequencies, players cannot bid for more than 130 MHz. Licenses will be valid 15 +5 years.
- A reserve price has been set at 562 KEUR for 2×1 MHz in 700 MHz frequencies and at 30KEUR for 1 MHz of spectrum in 3400-3800 MHz frequencies.
- Licenses included coverage obligations in both bands.
 - In 700 MHz frequencies:
 - 50% geographical coverage by year-end 2022 and
 - 90% geographical coverage by year-end 2024.
 - In 3400-3800 MHz frequencies:
 - 10 5G sites by year-end 2020,
 - 20 5G sites by year-end 2021,
 - 40 5G sites by year-end 2022 and
 - 80 5G sites by year-end 2024 in.

Auction (3/3)

- Four out of the five bidders have acquired 5G frequencies in the 700MHz FDD and 3600MHz TDD spectrum auction, paying a total of 41.3 million EUR
- Orange, Post and Proximus were each awarded one of the three available lots of 2×10MHz in the 700MHz band.
- In the 3600MHz band, Orange and Post each acquired 110MHz of frequencies, Proximus bought 100MHz and Luxembourg Online 10MHz.
- Eltrona participated in the auction but failed to secure spectrum rights.

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5G Ecosystem (1/4)

- Launching successful and innovative 5G services implies a major shift of the mobile telephony market towards a greater **sharing** of elements of the network (slicing) and services (small cell as a service) between different stakeholders that did not necessarily work together before
- Operators, vendors, public administration, the so-called verticals, transport, logistics, health and security industries amongst others are becoming **actors in a different connectivity paradigm**

5G Ecosystem (2/4)

- Coordination between these different stakeholders will be needed to address the many issues that working together towards a **common goal** entails
- In line with Luxembourg's ambitious 5G Strategy; its resources of connectivity, know-how and human capital; its geographical position and size, the country is ideally suited to host a 5G Ecosystem which will offer to stakeholders that are in Luxembourg **the hub** that they need to nest their ideas and projects

5G Ecosystem (3/4)

- inCITES is working with the Luxembourg's government to **gather ideas and consent** towards the adoption of a 5G Coordination Mechanism or Ecosystem, by interviewing all relevant stakeholders and discussing with them which mission, goals, objectives and structure this Ecosystem should have
- Although it is too early to forecast results, we can say that companies, institutions and academia have expressed a **vibrant aspiration** to participate to an Ecosystem where they can **meet**, exchange **ideas**, coordinate **policies and standards** as well as launch **tests and projects**

5G Ecosystem (4/4)

- The participation of the Luxembourgish Government is called for by the stakeholders as a **facilitator** and a **promoter** of 5G networks and services
- We are working to create a consensus-driven, grass-root, bottom-up, multi-stakeholder approach, which will focus on a **few specific topics** leveraging on Luxembourg's existing industrial strengths
- The 5G Ecosystem shall seek funding from international institutions, the Luxembourg's Government and its founders to launch shared innovative projects that will contribute to **shape the future of 5G**.

5G strategy details



<https://digital-luxembourg.public.lu/initiatives/5G>

Thank you!



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