Implications of innovation in NGAN for national broadband strategies

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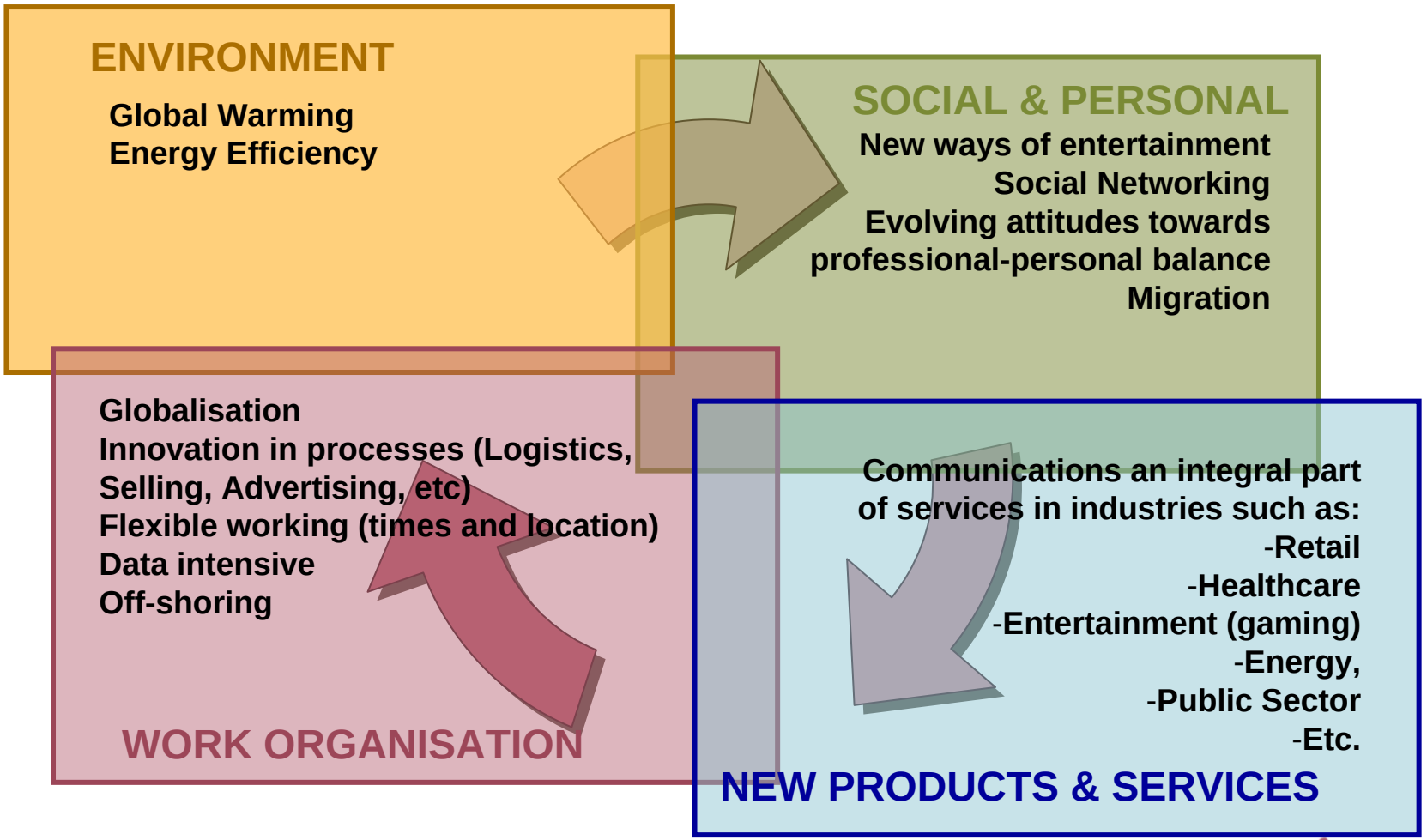
Next-generation access networks are required because of growing demands for bandwidth

- Jakob Nielsen's Law (1998): User bandwidth increases by 50% every year (other estimates vary)



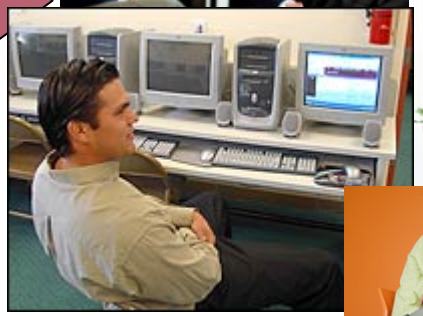
There are relevant differences between the previous deployment of ADSL and the roll-out of NGAN

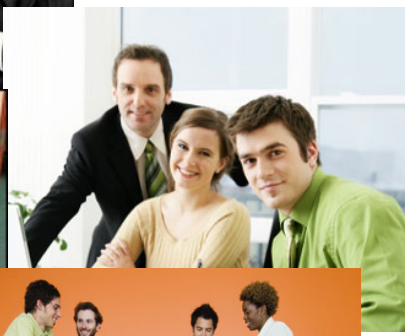
	ADSL	NGAN (FTTH)
Bandwidth increase with the new technology	x10 to x100	x10 to x100
How much it costs?	~100 EUR per customer	~1000 EUR per customer
What is the money spent in?	Access Equipment Upgrading backbone	Civil works (~45%) Cables (~20%) Customer connection (~10%) Equipment (~25%)
What is the expected life of investments?	~5 years	~10 to 30 years
Who invests?	Incumbent operator Alternative operators (using the physical infrastructure of the incumbent)	Incumbent Municipalities Utilities New operators New types of investors

Policy makers emphasize the impact in economic growth when making the case for next generation networks

Investing in NGAN consists mainly (over 75%) in building ducts, laying cable and similar civil-work activities

If the right conditions apply, these investments fuel economic growth in knowledge and high-tech industries





Pictures taken from netperfsys.com

Does this mean that the case is clear for pushing fast NGAN?

- Threat of a bandwidth collapse if no NGAN investment
- NGAN take long to build, the sooner we start the better
- Being among the first to deploy NGAN will give my companies and citizens an edge in the global economy

BUT

- NGAN deployment still expensive, economics not clear in many areas
- Access not necessarily the bottleneck in today's broadband networks
  - Although the most relevant for the long-term
- Technological choices still uncertain

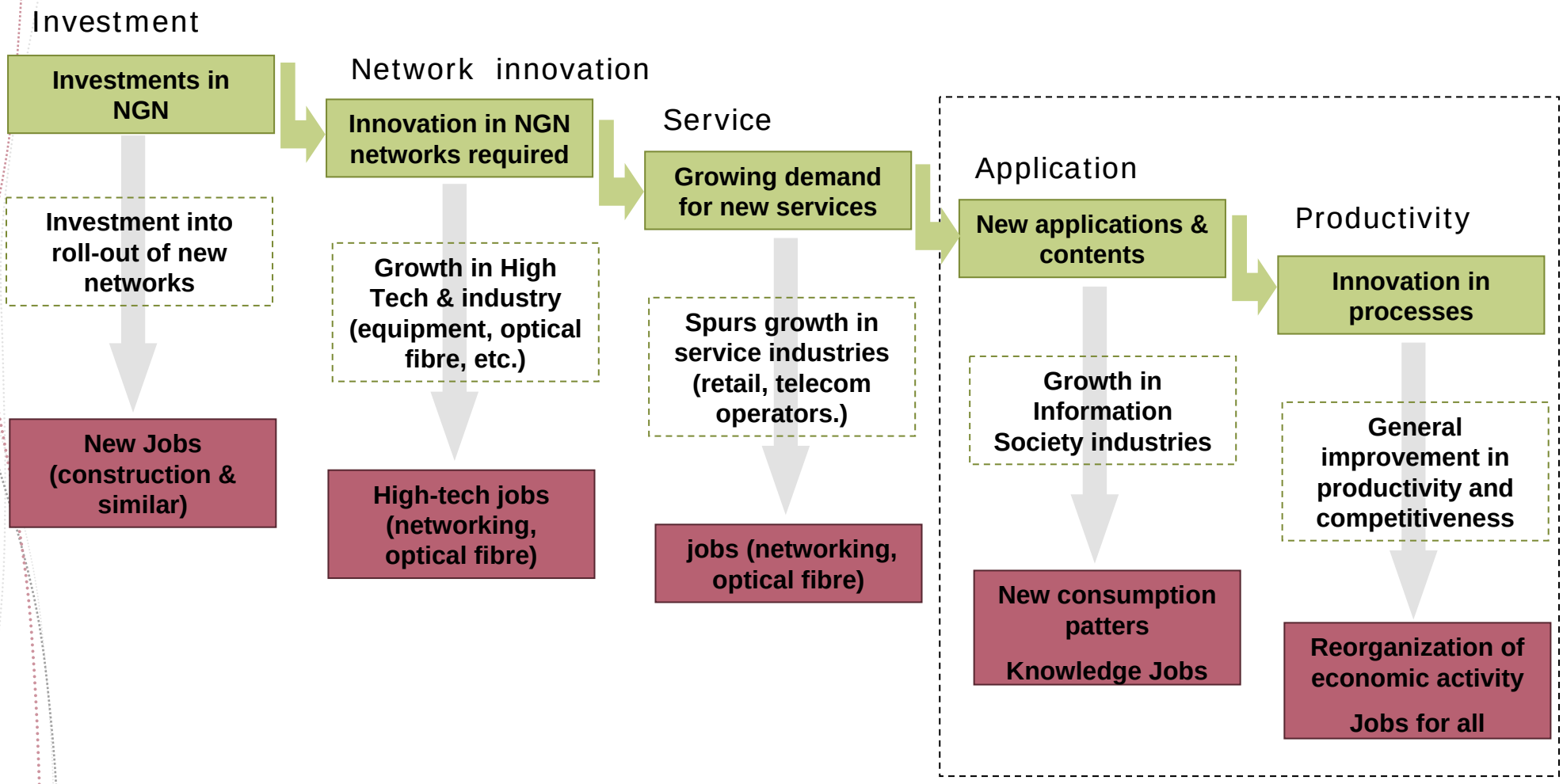
NGAN innovation's mission is producing cheaper (and faster) networks, thus removing economic barriers for NGAN deployment

LEVEL	INNOVATION RATE	INNOVATION AREAS (examples)	CHALLENGES
APPLICATIONS	✓✓	New & better services	Producing social and economic transformations
NETWORKING	✓	Quality of Service by traffic types	Ensuring adequate reliability while sharing networks Supporting functionality for new applications
EQUIPMENT	✓	Increased integration & miniaturization Self installation (customer premise)	Cost reduction Increased capacity
DUCTS / CABLES	✓	Cables easier to bend, connect and more resistant Deployment techniques for reuse of existing ducts Financial innovation	Cost reduction Environmental / Social impact

Countries that have successfully promoted NGAN have done so on the basis of favourable local conditions

COUNTRIES	CHARACTERISTICS	APPROACH TO NGAN
Japan Korea	Very favourable geography Strong role of government in telecoms policy Industrial policy strategic interest Economic stall	Incentives from the government (financing, taxation,) Fibre unbundling obligations (Japan) Strong FTTH growth / DSL operators under strain
Netherlands Sweden	Relatively favourable geography Strong broadband penetration Sophisticated consumers Welfare state culture Strong role of local government	Open Networks (promoted by municipalities / alternative operators) Incumbents forced to deploy FTTH due to risk of becoming irrelevant

The ‘big prize’ for pioneers in NGAN is fuelling social and economic transformations due to new applications and processes



- But they are also giving local firms a chance to become world-class leaders in NGAN-related technologies and promoting growth in services and consumer goods

Other advanced economies need to play catch-up in NGAN

- These countries are making progress, despite concerns about breaking with status quo and which is the best strategy moving forward

COUNTRIES	CHARACTERISTICS	APPROACH TO NGAN
France United Kingdom Other EU members	Competition based on non-discriminatory access obligations imposed to incumbents Some competition at infrastructure Regulators with strong focus on sector metrics	Focus on infrastructure Enforcing non-discriminatory access (bitstream, fibre, duct) Some countries enforcing functional separation Net neutrality not central issue
Unites States	Strategic interest in content & applications Strong competition between LECS and cable operators No local loop unbundling (LLU)	No regulatory obligations for fibre providers Central debate on the issue of net neutrality FTTH deployment driven by market competition
Germany	Troubled, government-participated incumbent Industrial policy interests	Regulatory holidays to promote investments

Tier-2 countries should incorporate the effects of innovation in establishing their NGAN strategies

- Start with a realistic assessment of the likely impact of NGAN will have in the overall economy
- There are also benefits in being a **follower** in NGAN:
  - Waiting for further cost reductions (cost reductions ~ -20% per year)
    - These cost reductions may promote private investment
  - Waiting can reduce risk of a making the wrong technology choice
  - These benefits are especially relevant if the country is not in a position to shape innovation in NGAN technology
- But there is always a 'next generation' thing – at some point works need to start
- Innovation (technological and financial) will make threat of entry more credible
  - This will promote investment by established operators
- The benefits of NGAN require transmission mechanisms to transform cables and ducts into deep economic transformations
  - Assess impact so far and identify actions required in preparation
  - Can firms benefit from NGAN development in *other* countries?
- Finally, is it an opportune time for roll-out?

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THANKS FOR YOUR ATTENTION

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