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# Very High Capacity and 5G Networks: From the EU Code to the EU Market

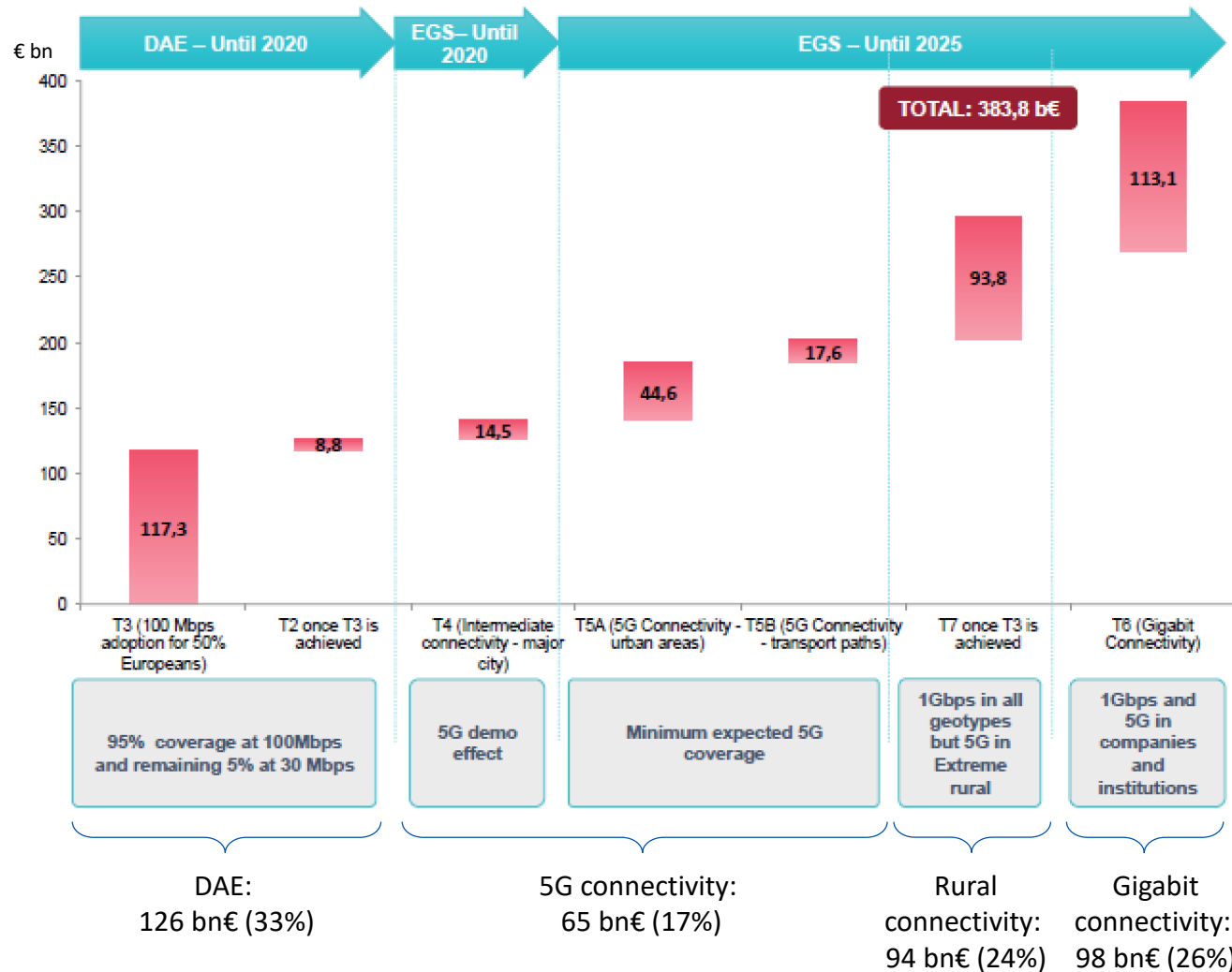
**Harald Gruber**  
European Investment Bank

CEPS - DEEP-IN Workshop

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The views expressed are the opinion of the presenter and might not correspond to that of the EIB Group.

# The required investments to reach the targets of the DAE and the EGS amount to 384 bn€ until 2025.



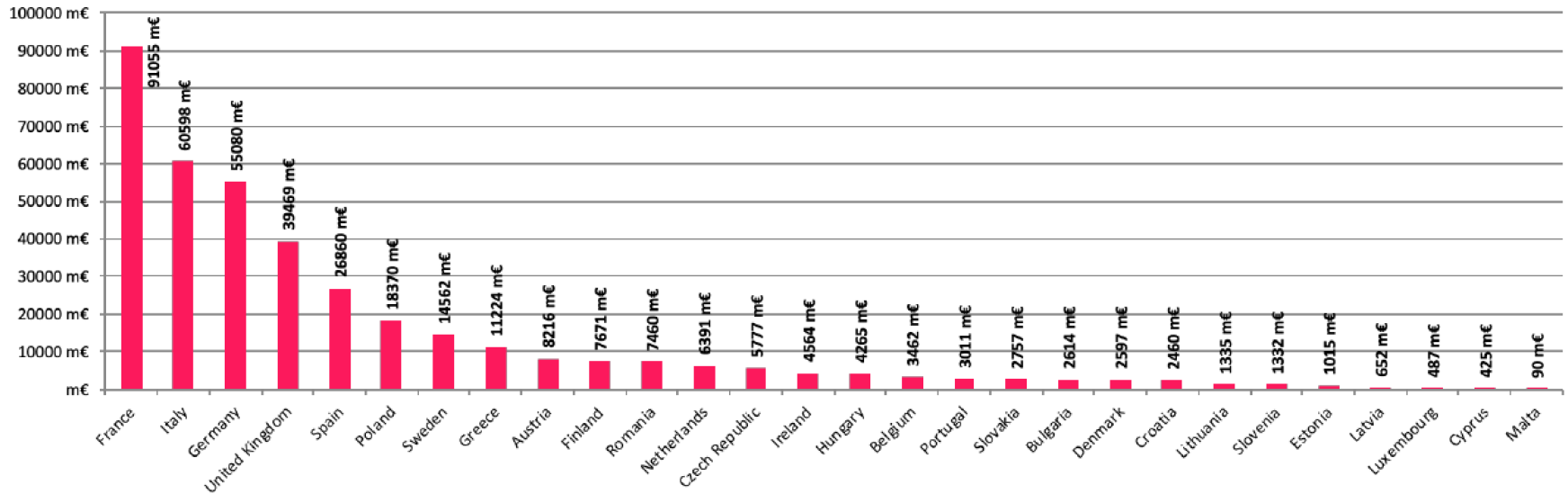
## Further analysis of the required investment:

Geotype	% Invest.	% Pr*
Urban	20%	32%
Suburban	25%	36%
Semi-rural	30%	21%
Rural	21%	10%
Extreme-rural	4%	1%

\*Pr = Premises

- 72% for wired connections (premises, excl. companies)
- 36% in cohesion regions

## Five countries make up 71% of the total investment need.



**Countries with largest investment need:** France (24%), Italy (16%), Germany (14%), UK (11%), and Spain (7%).

### Countries reached DAE in 2018: (8)

- Malta, Cyprus, Luxembourg, Latvia, Denmark, Portugal, Belgium and the Netherlands.

# The investment gap for public funding to reach the targets of the DAE and the EGS is ca. 254 bn€.

Expected private investments relevant for the DAE and EGS targets until 2025 amount to ca. **130 bn€**.

→ **Cover (only) 33% of total investment needs**

→ **Investment gap: ca. 254 bn€**

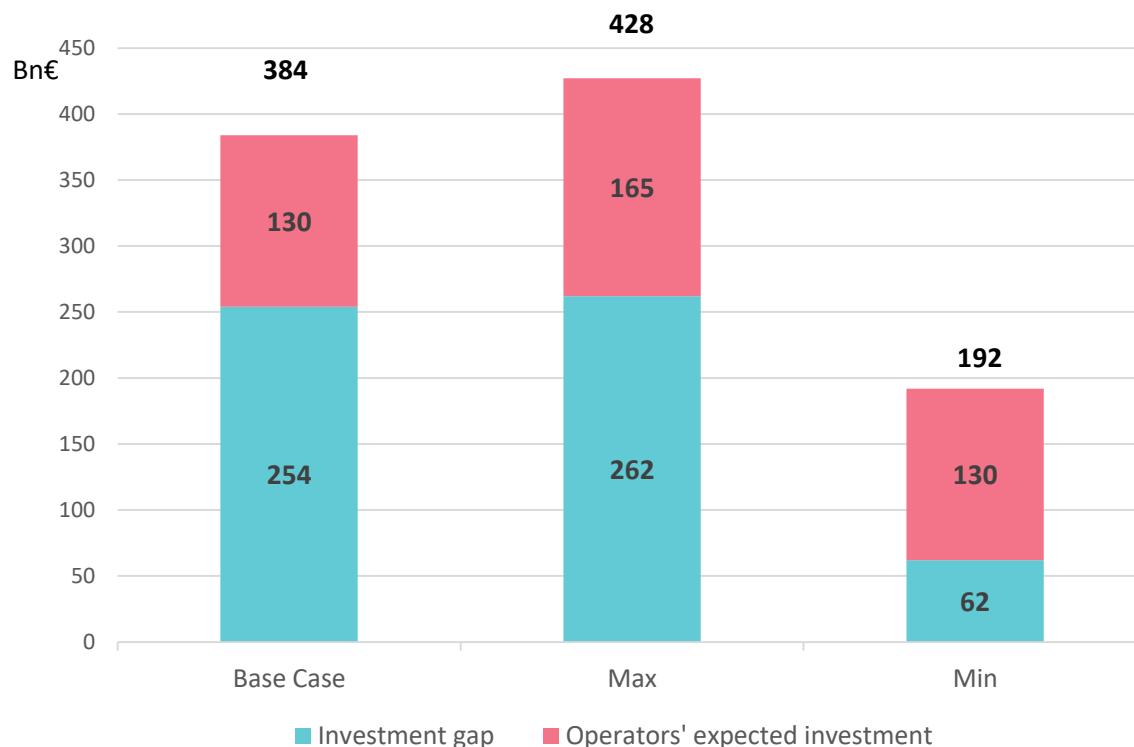
## Alternative scenarios:

### 1. Max:

- FTTC in extreme-rural + max 5G quality
- Investment need: **+15% to 428 bn€**
- Private investments: **39%**
- Investment gap: **262 bn€**

### 2. Min:

- Wireless technologies in all 3 rural geotypes + only 1m socio-economic drivers/enterprises
- Investment need: **-53% to 192 bn€**
- Private investments: **68%**
- Investment gap: **62 bn€**



# Selected EU regulation/policy for broadband

## Digital Agenda

## State Aid<sup>1</sup>

## Gigabit Society

## ECC

100% coverage  
>= 30 Mbps  
By 2020

50% up-take  
>= 100 Mbps  
By 2020

*White areas:*  
**No** coverage  
>= 30 Mbps (NGA)

*Grey areas:*  
One operator  
>= 30 Mbps (NGA)

*Black areas:*  
>= Two operators  
>= 30 Mbps (NGA)

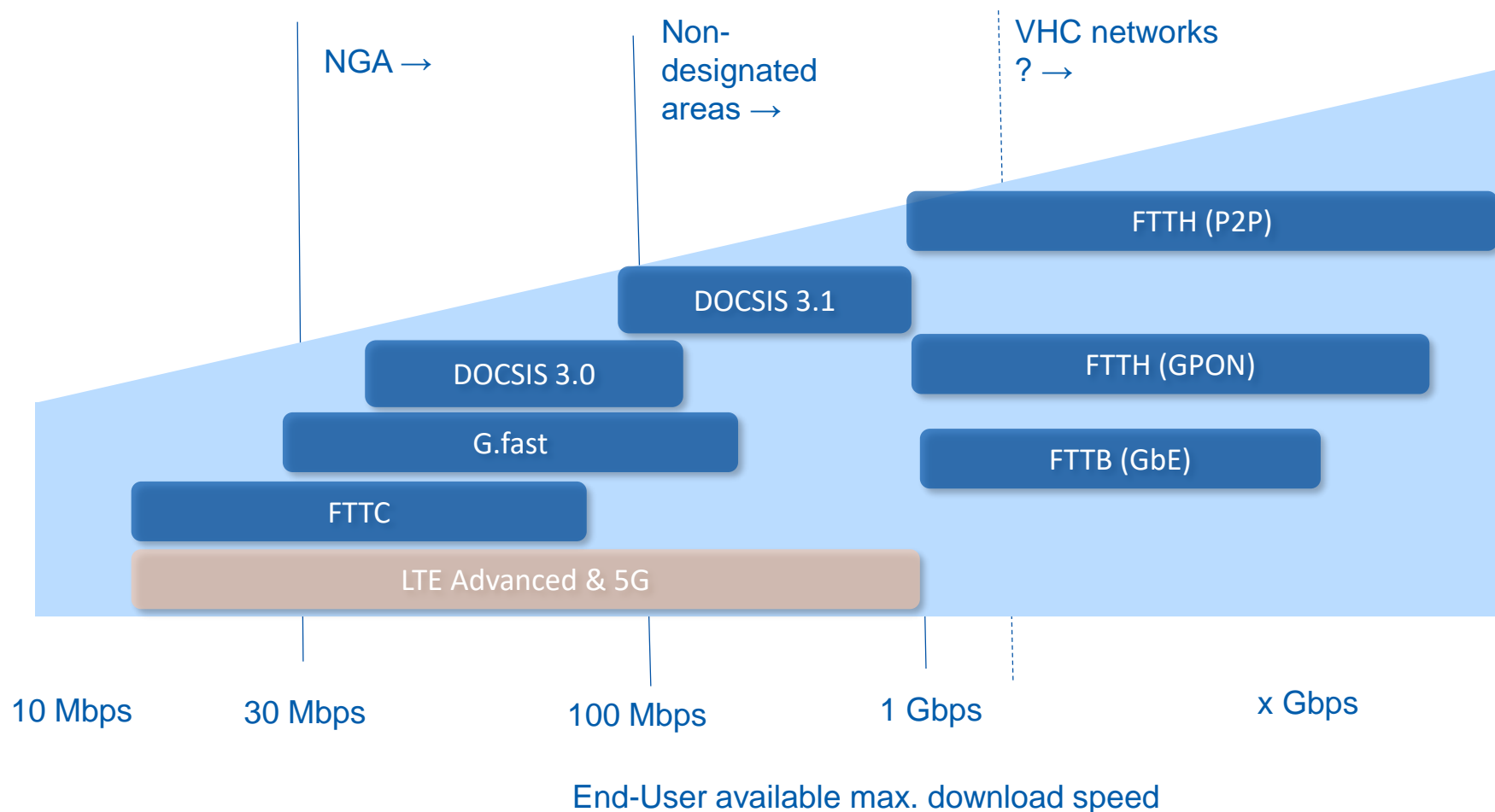
100% schools,  
transport hubs,  
public services,  
digitally intensive  
enterprises  
>= 1Gbps  
By 2025

100% coverage  
>= 100 Mbps  
Upgradable Gbps  
By 2025

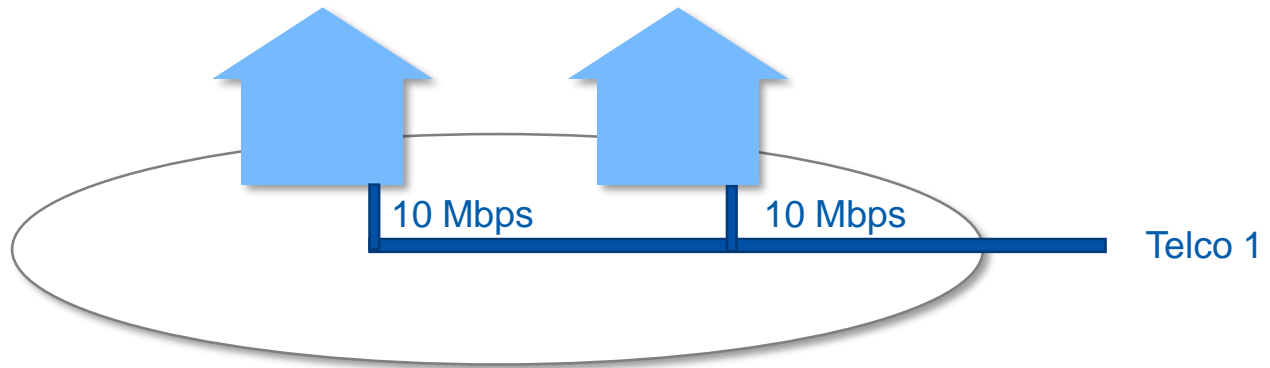
*Very high capacity  
Network:*  
«fibre elements» or  
equivalent

*Designated areas:*  
< 100 Mbps

# Very high capacity networks: what does it comprise?

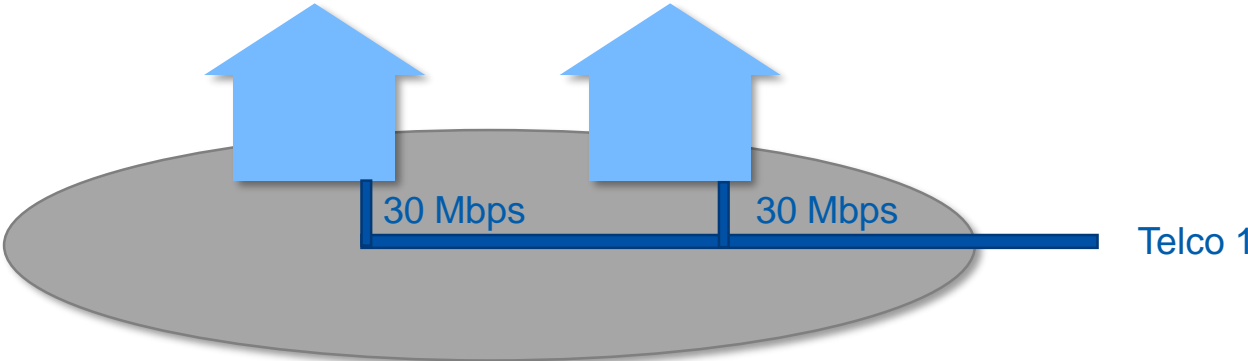



# NGA and very high capacity networks: scenario 1



Regime	Assessment	Conclusion
State Aid	No NGA	<input type="checkbox"/> White area
EECC	No VHC network	Designated area

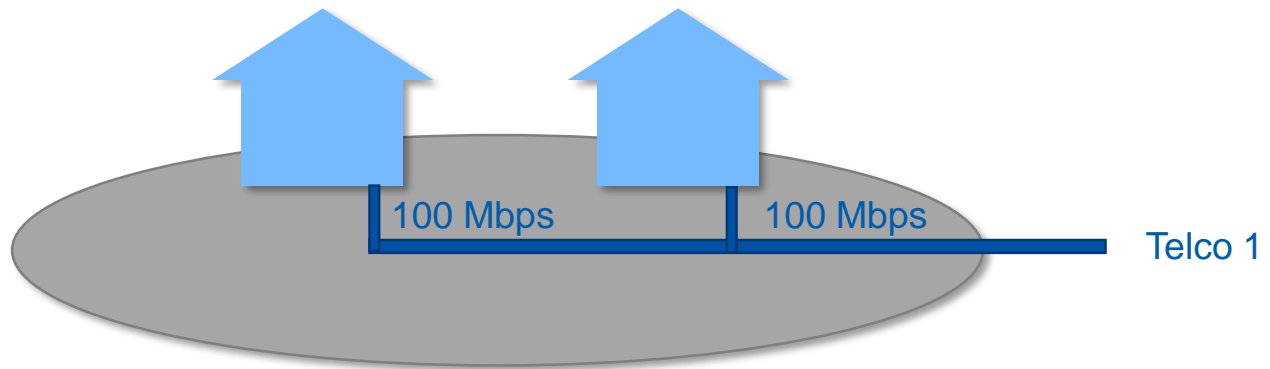
# NGA and very high capacity networks: scenario 2




Regime	Assessment	Conclusion
State Aid	NGA & 1 operator	 Grey area
EECC	No VHC network	Designated area

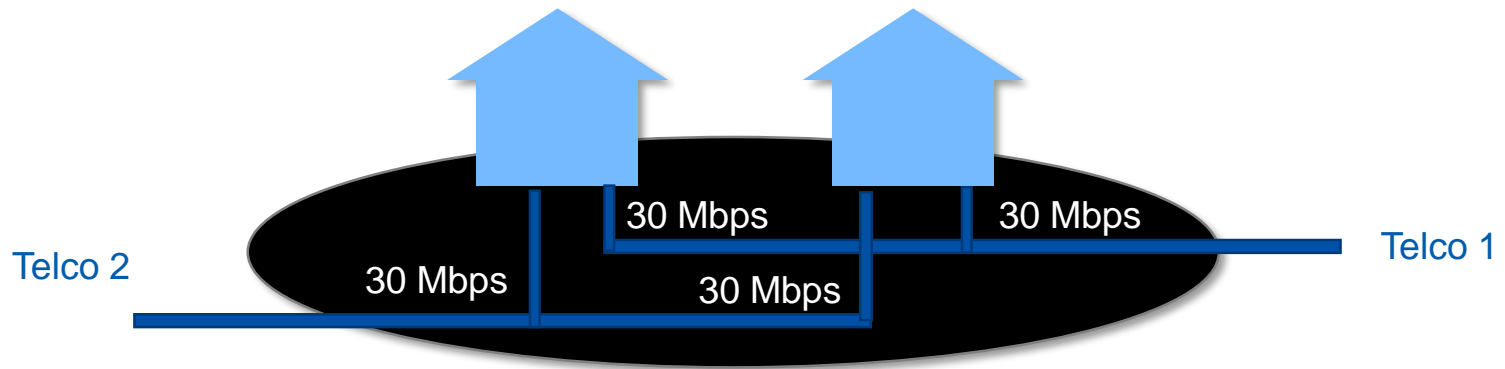


# NGA and very high capacity networks: scenario 3



Regime	Assessment	Conclusion
State Aid	NGA & 1 operator	 Grey area
EECC	VHC network?	No Designated area

# NGA and very high capacity networks: scenario 4



Regime	Assessment	Conclusion
State Aid	NGA & 2 operators	■ Black area
EECC	No VHC network	Designated area

# Challenges for EECC

Digital Agenda

State Aid<sup>1</sup>

Gigabit Society

ECC

100% coverage  
< 30 Mbps  
By 2020

50% up-take  
< 100 Mbps  
By 2020

*White areas:*  
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*Grey areas:*  
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**?** ≥ Two operators  
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100% schools,  
transport hubs,  
public services,  
digitally intensive  
enterprises  
< 1Gbps  
By 2025

100% coverage  
< 100 Mbps  
Upgradable Gbps  
By 2025

*No Very high capacity  
Network available:*  
«fibre elements» or  
equivalent

*Designated areas:*  
< 100 Mbps

1: 2013/C 25/01



30 Mbps

100 Mbps

1 Gbps

# Conclusions

- ▶ Gigabits Society targets for VHC networks are far beyond what market forces can deliver
- ▶ Investment gap needs to be fulfilled with a substantial degree of public support
- ▶ State aid can be used to mobilise private investment
- ▶ State Aid Guidelines for broadband need revision for VHC networks
- ▶ High risk of failing to meet Gigabit Society goals