Can HbbTV (and other standards) help making streaming (more) sustainable

Presentation to HbbTV Webinar – 14 May 2025

Vincent GRIVET
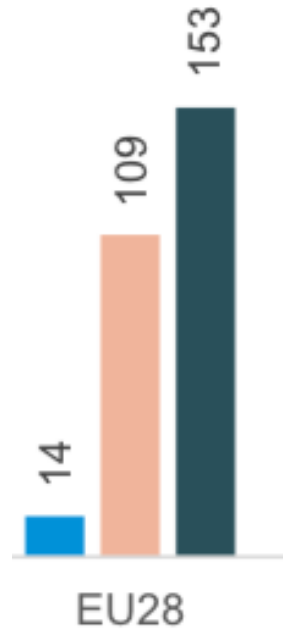*BMV Consulting - Founder & Coordinator - The LoCaT Project*
Chairman HbbTV

An important reference

LoCaT
The Low Carbon TV delivery Project

How **green** (or not green) is the delivery of TV content across Europe ?
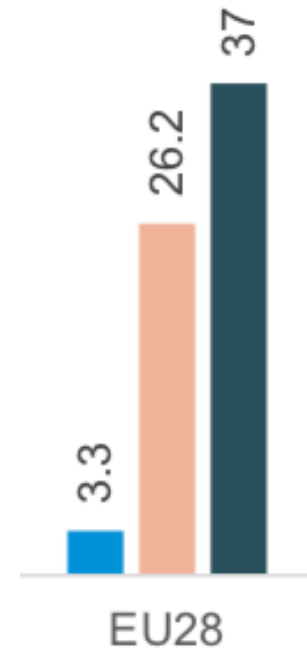
Visit : https://thelocatproject.org/

LoCaT indicates major differences between delivery platforms

WH of energy for 1 hour of viewing
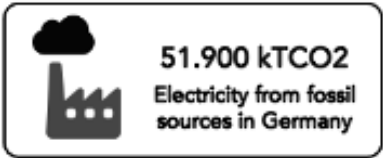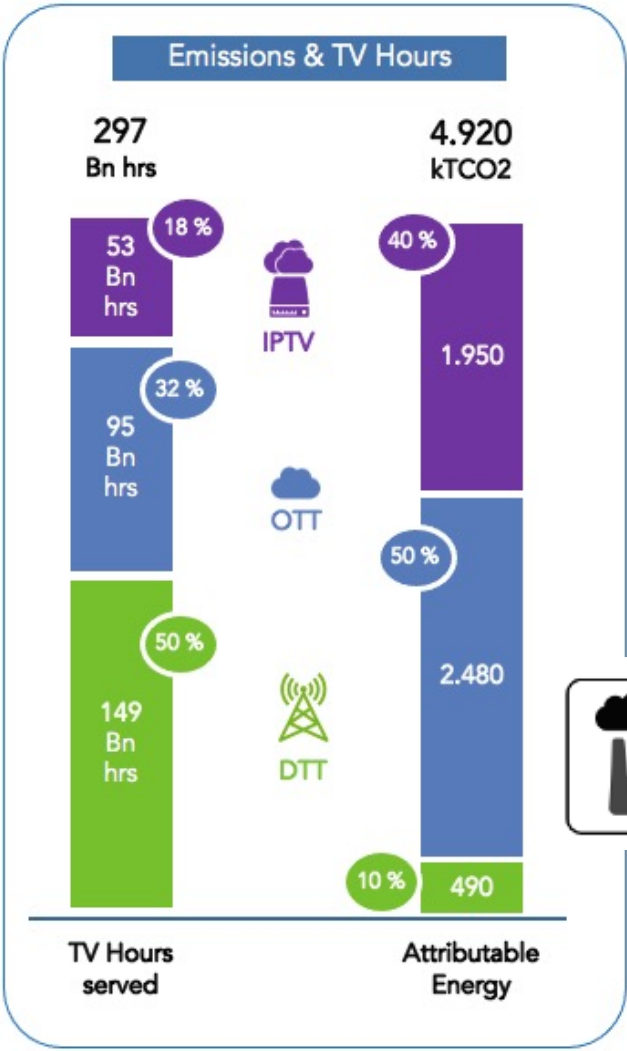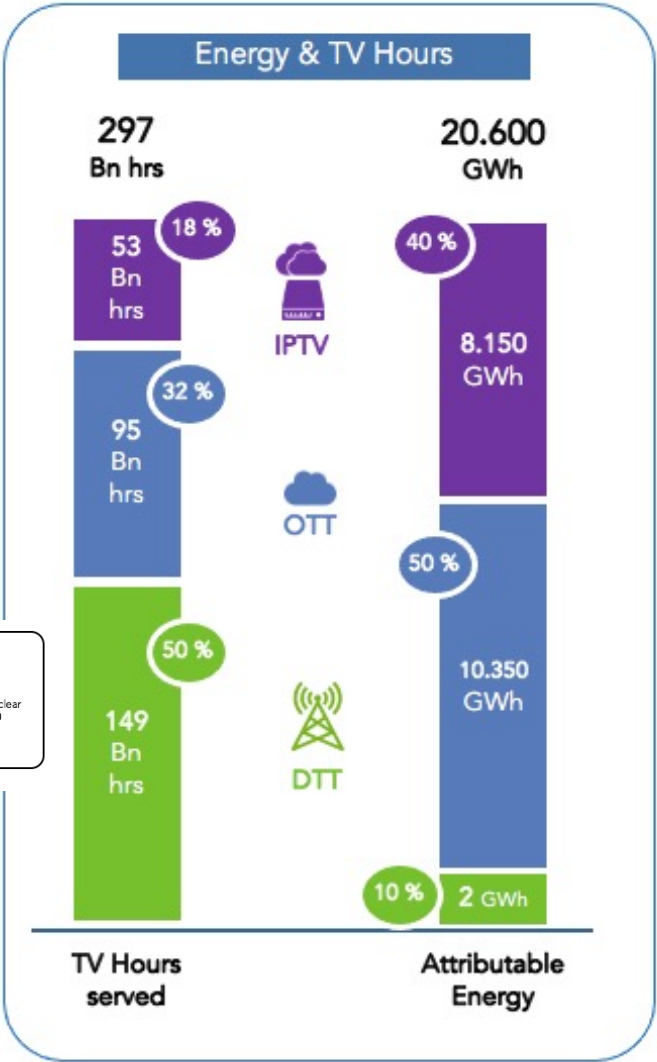
Source : Results for 2020 of LoCaT study

g of CO2 for 1 hour of viewing

DTT   OTT   Managed IPTV

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3

What it means

Source : The LoCaT Project (2020) – EU28

Energy & TV Hours

	TV Hours served		Attributable Energy
	297 Bn hrs		20.600 GWh
IPTV	53 Bn hrs (18 %)		8.150 GWh (40 %)
OTT	95 Bn hrs (32 %)		10.350 GWh (50 %)
DTT	149 Bn hrs (50 %)		2 GWh (10 %)

6.600 GWh — Average production of nuclear reactor in France 2020

Emissions & TV Hours

	TV Hours served		Attributable Energy
	297 Bn hrs		4.920 kTCO2
IPTV	53 Bn hrs (18 %)		1.950 (40 %)
OTT	95 Bn hrs (32 %)		2.480 (50 %)
DTT	149 Bn hrs (50 %)		490 (10 %)

51.900 kTCO2 — Electricity from fossil sources in Germany

4

What if DTT would be replaced by streaming ?

PRO-FORMA !

OTT Increment

FUTURE

Savings DTT

AS IS

11.950 GWh

-2.050

29.700 GWh

20.600 GWh

Δ=9.140 GWh
+ 40%

1,5 x

6.600 GWh
Average production of nuclear reactor in France 2020

DISCLAIMER : *This is BMV pro-forma calculation extrapolating Results for 2020 of LoCaT study: more detailed analysis needed !*

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What if DTT would be replaced by streaming (2) ?

PRO-FORMA !

OTT Increment

FUTURE

Savings DTT

AS IS

Δ=2.190 kTCO2

+ 40%

+4 %

2.680 kTCO2

- 490 kT

7.120 kTCO2

4.920 kTCO2

51.900 kTCO2
Electricity from fossil sources in Germany
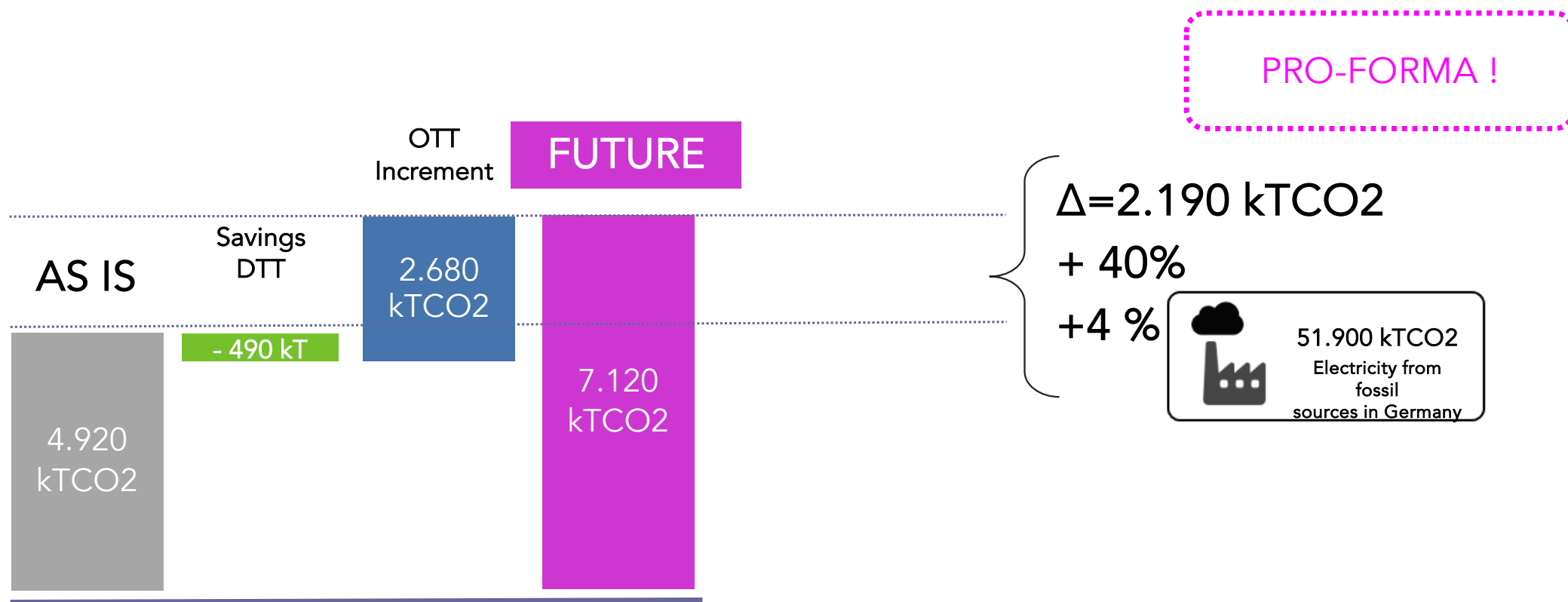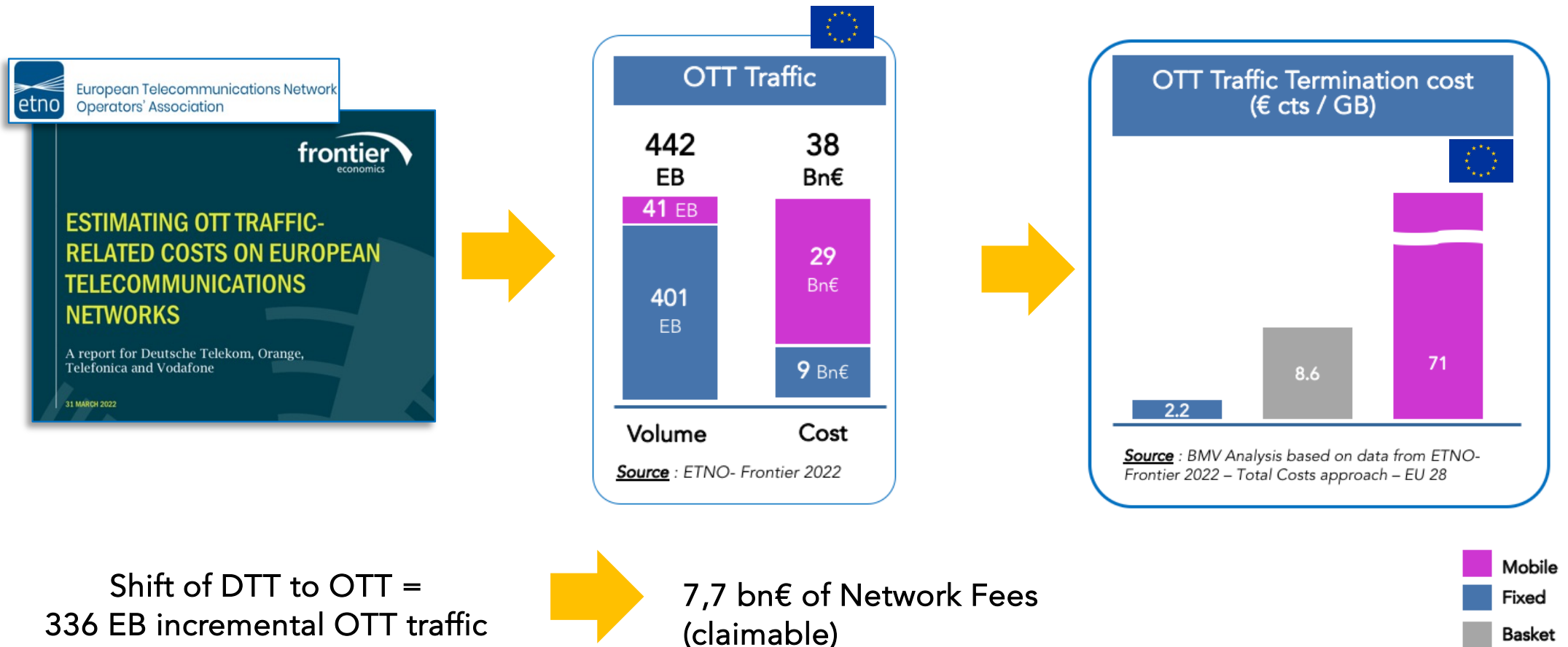
DISCLAIMER : This is BMV pro-forma calculation extrapolating Results for 2020 of LoCaT study: more detailed analysis needed !

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6

"All streaming" may also have a (significant) cost...

ESTIMATING OTT TRAFFIC-RELATED COSTS ON EUROPEAN TELECOMMUNICATIONS NETWORKS

A report for Deutsche Telekom, Orange, Telefonica and Vodafone

31 MARCH 2022

OTT Traffic

	442 EB	38 Bn€
	41 EB	
	401 EB	29 Bn€
		9 Bn€
	Volume	Cost

Source : ETNO- Frontier 2022

OTT Traffic Termination cost (€ cts / GB)

2.2   8.6   71

Source : BMV Analysis based on data from ETNO-Frontier 2022 – Total Costs approach – EU 28

Mobile
Fixed
Basket

Shift of DTT to OTT =
336 EB incremental OTT traffic

7,7 bn€ of Network Fees
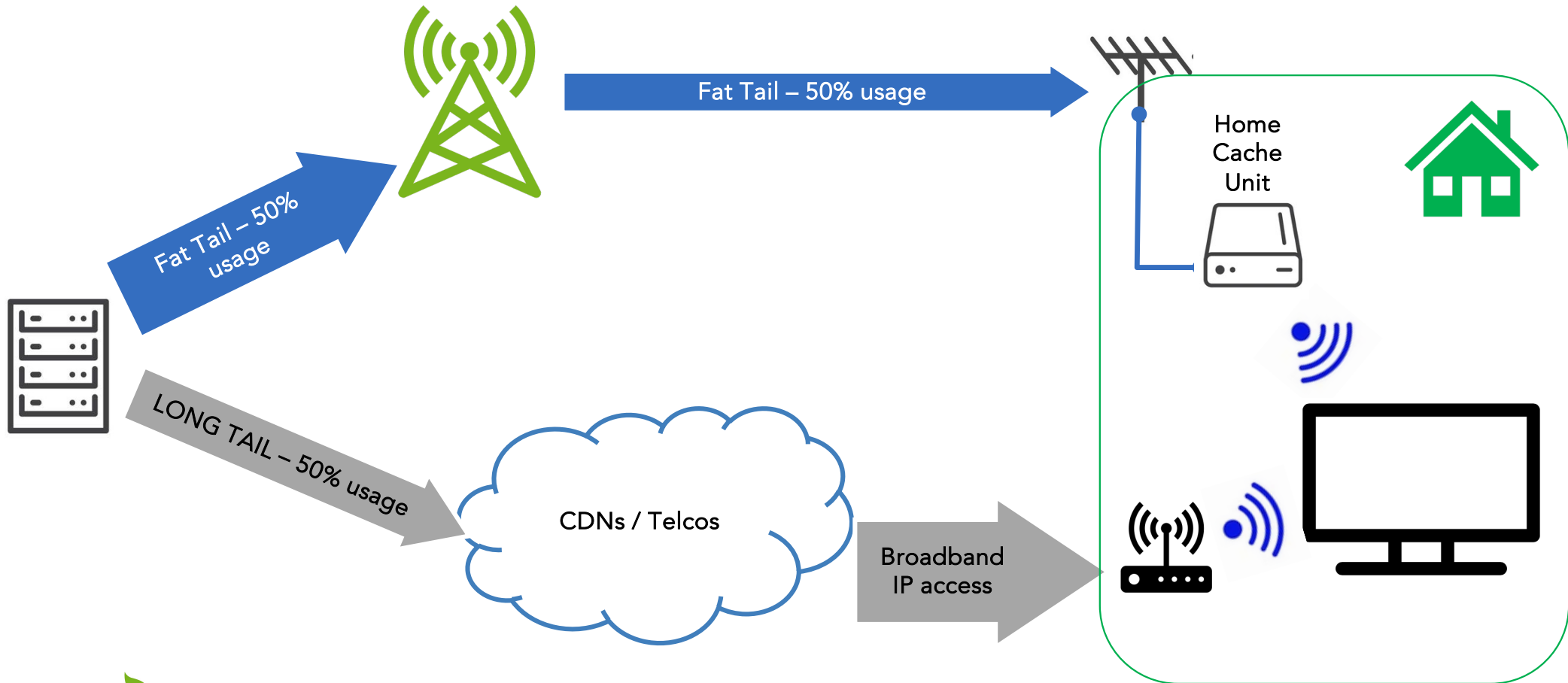(claimable)

7

HbbTV helps greener TV watching

- Consumers are tempted to less classical TV experiences; VOD+ app

- … which are strongly (excessively) associated to "streaming" distribution model, even for linear

- But keeping live TV watching on Broadcast is relevant

- HbbTV will help this ;

  1. **Enrichment of consumer experience** with HbbTV interactive services mitigates Broadcast exit motivation of consumer

  2. **HbbTV-TA** removes the exit motivation of Broadcaster as it opens valuable addressable advertising in linear TV (without the need to go to streaming)

  3. **HbbTV OpApp** enables an app-minded experience which still leverages energy efficient broadcast delivery for linear program (without any end user action): Freely example :

Other adjacent standards may also help more sustainable TV viewing

DVB-I   :   automatic selection of (low energy) broadcast instance of a live program (if available)

DVB-NIP   :   "forward" IP streams to non-Broadcast devices, replacing (high impact) IP delivery by broadcast delivery (low impact)

DVB-HB   :   also forward Broadcast streams to non-Broadcast devices (but need to locally recode)

DVB-MABR: favour multicast delivery of live programs thanks to an harmonized multicast technology

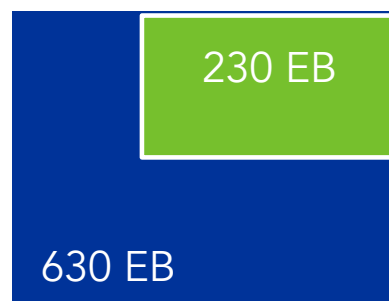# Offloading VOD traffic to a broadcast network : push and cache

Fat Tail – 50% usage

Fat Tail – 50% usage

LONG TAIL – 50% usage

CDNs / Telcos

Broadband IP access

Home Cache Unit

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10

Potential Caching off-load benefits

PRO-FORMA !

- ■ EU28 VOD 2020
- ■ Off-load

	Hours (Bn)	Data (EB)	Energy (GWh)	CO2 (kTCO2)
Off-load	34 Bn hrs	230 EB	3.830 GWh	920 kTCO2
EU28 VOD 2020	96 Bn hours	630 EB	10.945 GWh	2.620 kTCO2

SOURCE : illustrative simulation by BMV of impacts assuming 35% of on demand viewing can be handled via push and cache. Based on 2020 LoCaT numbers

Some Conclusions

- TV delivery has a non-insignificant energy / carbon impact (3,x nuclear reactors)

- Broadcast delivery has a significantly lower energy/carbon impact (1 to 10 ratio)

- Trend to "all TV in streaming"; appeals to end-users, appeals to broadcasters, encouraged by SmartTVs

- HbbTV specifications can mitigate the "need" of shifting to streaming and thus help mitigating the growth in the TV delivery energy and carbon impacts

  1) Core spec   2) HbbTV-TA   3) OpApp   4) Push-VOD function

- Additionally, a push & cache approach (powered by HbbTV) could significantly mitigate the VOD energy and carbon impacts

- other open adjacent standards can also play a significant role

  1) DVB-I   2) DVB-NIP   3) DVB-HB   4) DVB-MABR standards

Open European Standards help making TV delivery sustainable

Thank You !