

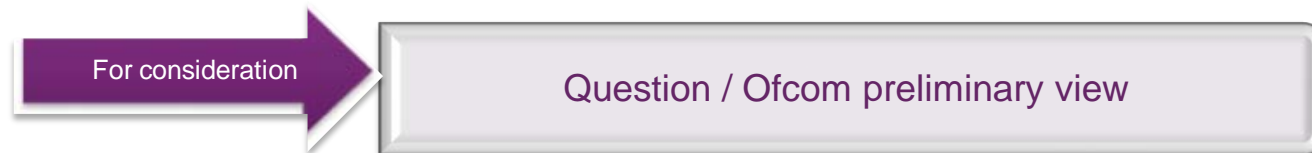
Mobile Call Termination Market Review 2015-2018 – workshop with industry

MCT Review Project team

Riverside House
23 October 2013

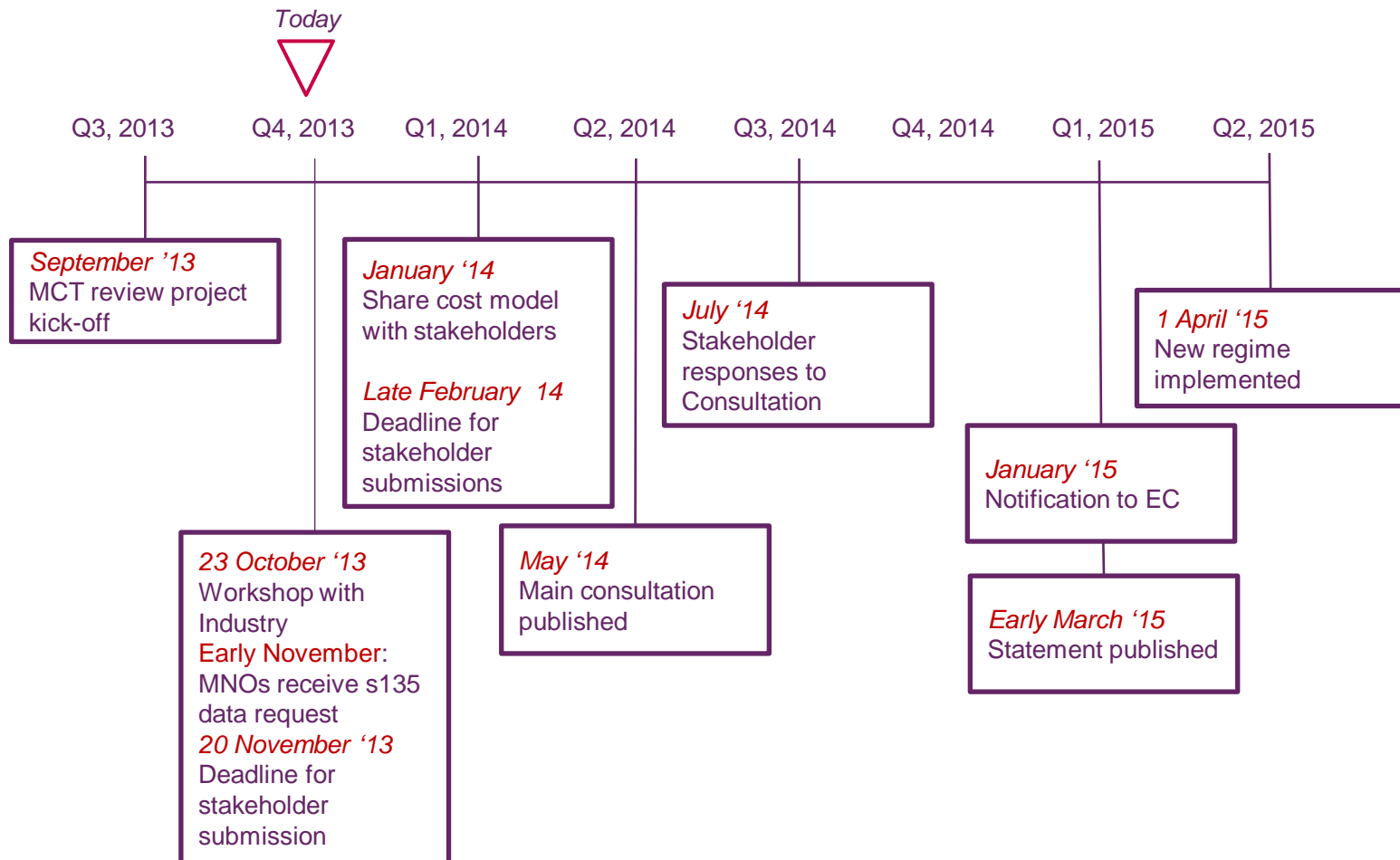
Workshop aims

- We will recap on current MCT regulation, market definition, SMP, remedies and cost model assumptions for the charge control
- We want to share our initial thinking with you, and give you a chance to tell us what you think
- We will highlight a series of issues/questions where we want to take input from you



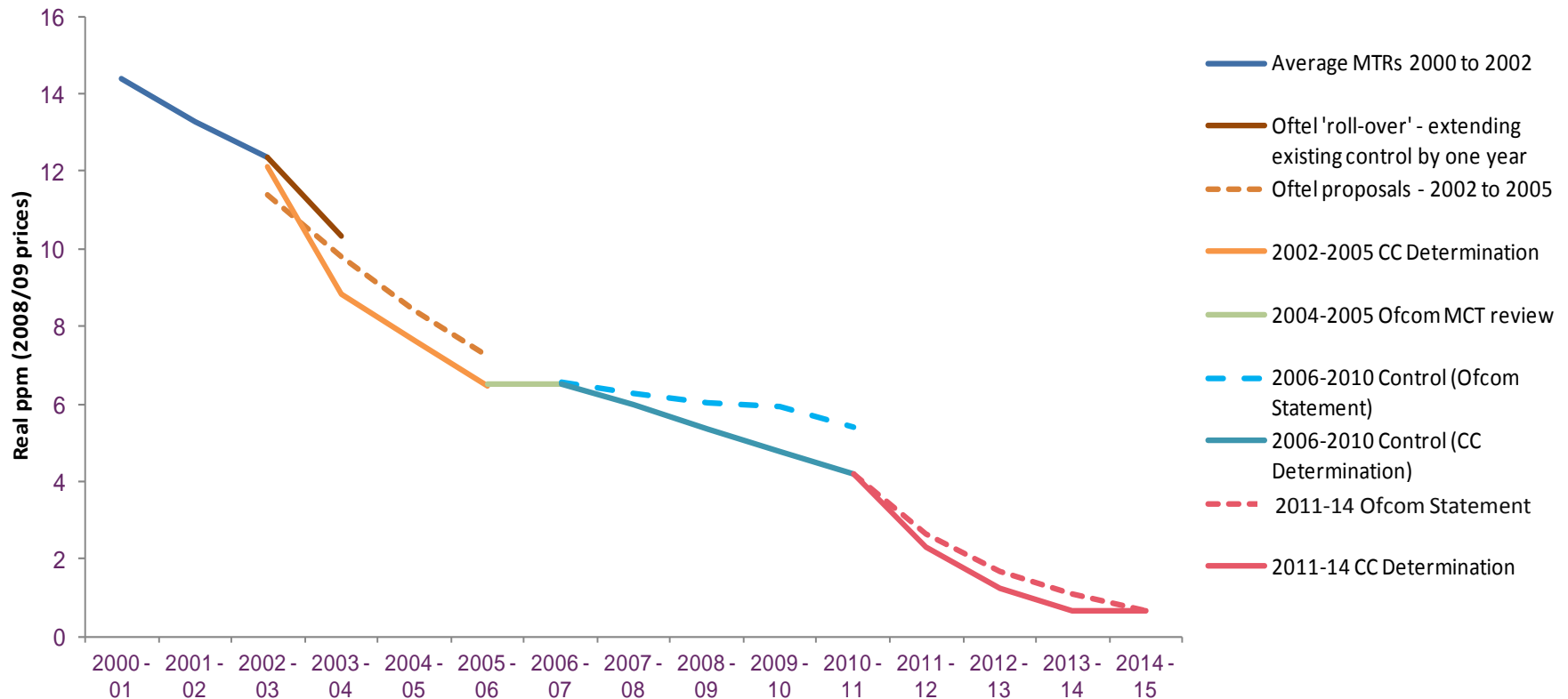
- We can take input today but are happy to get your views in writing and/or in follow-up meetings/calls (written input no later than 20 November 2013 please)
- Do ask questions or seek clarification as we go along – open Q&A session at the end

Market Review timeline



MTRs have fallen by more than 90% in the last decade

Summary of past MTR regulation

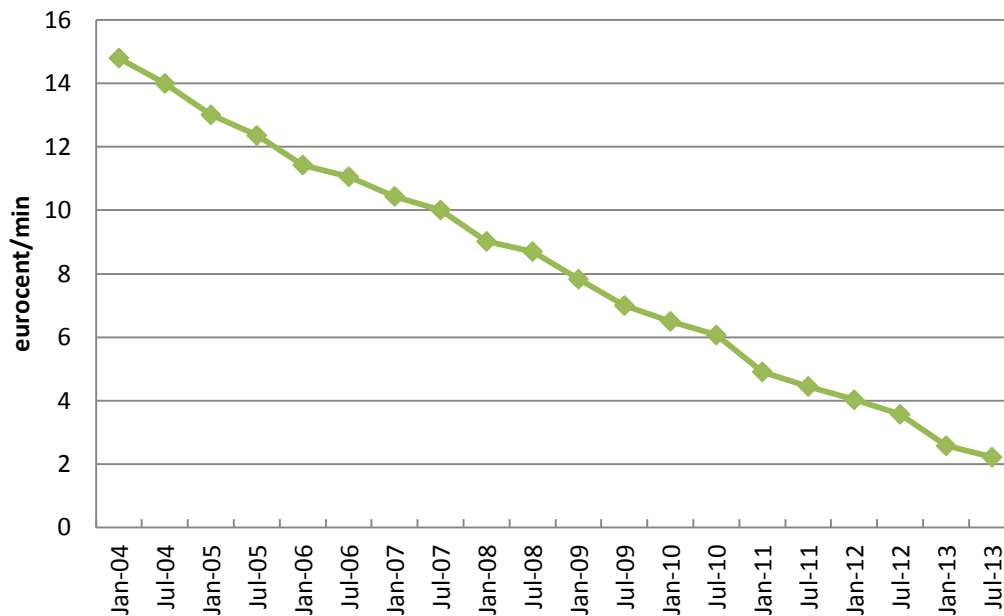


The 2011-15 charge control has reduced MTRs by 84% on a glide path

Across Europe, regulators increasingly set MTR caps based on LRIC standard modelling

MTRs around Europe

Average MTRs in Europe – time series (32 countries)

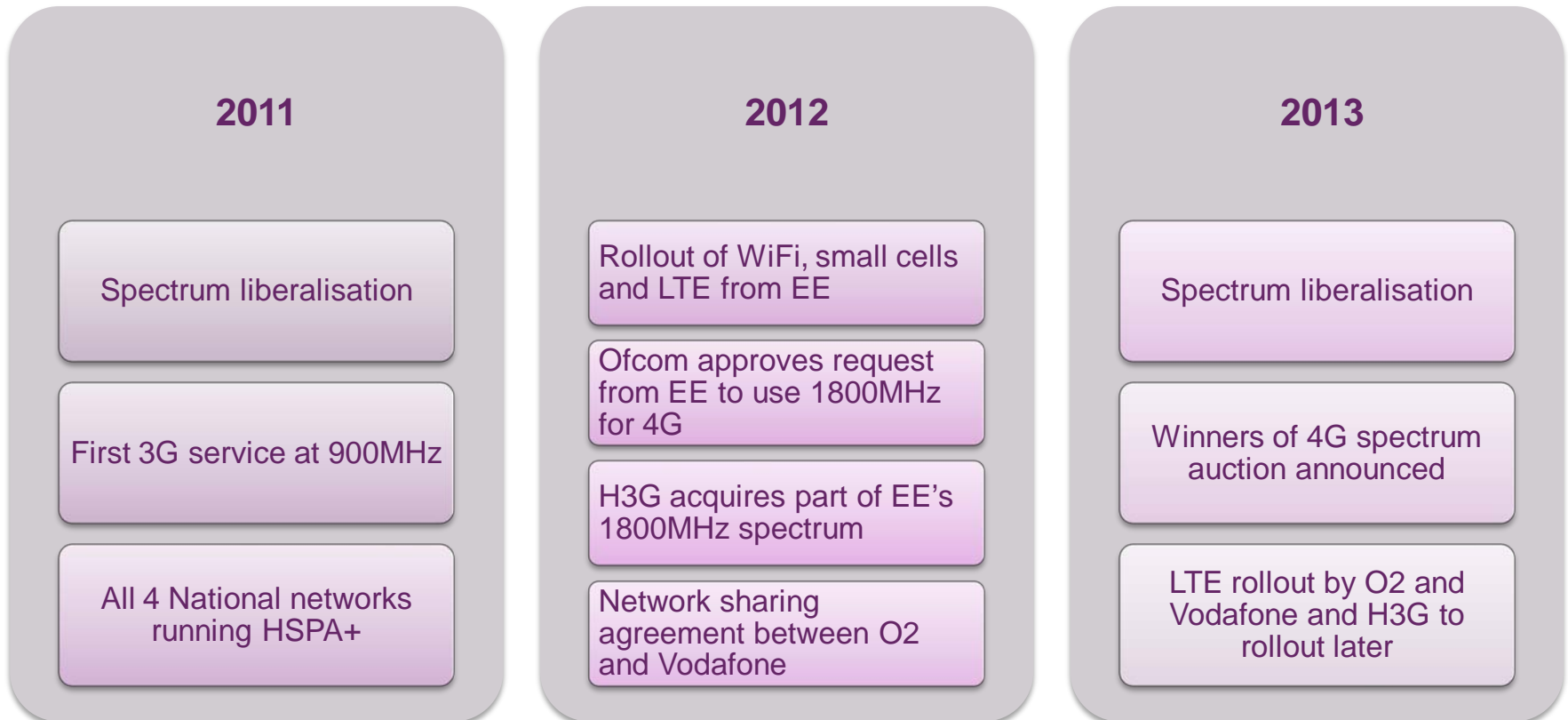


| Country | Cost standard |
|----------------|--------------------------------------|
| Belgium | LRIC from 01-Jan-13 |
| Czech Republic | LRIC from 01-Jul-13 |
| Denmark | LRIC from 01-Jan-13 |
| Finland | Unregulated (subject to EC Phase II) |
| France | LRIC from 01-Jan-13 |
| Germany | LRIC+ (although EC Phase II) |
| Greece | LRIC from 01-Jan-15 |
| Ireland | Benchmark (subject to appeal) |
| Italy | LRIC from 01-Jul-13 |
| Netherlands | LRAIC+ after appeal |
| Norway | LRAIC+ (not EU member state) |
| Poland | LRIC from 01-Jul-13 |
| Portugal | LRIC from 31-Dec-12 |
| Spain | LRIC from 01-Jul-13 |
| Sweden | LRIC from 01-Jul-13 |

Source: BEREC, MTR Benchmark

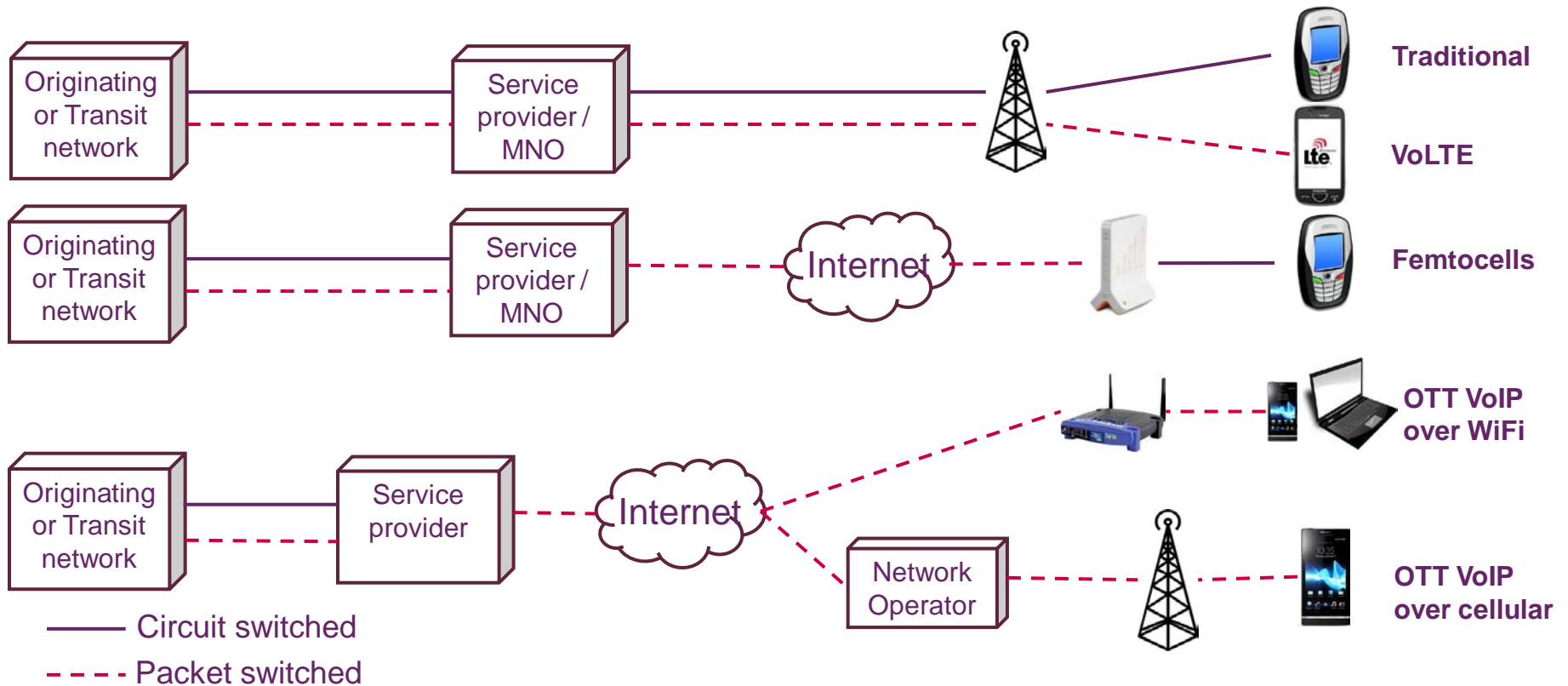
The mobile landscape has changed since the last review with new network rollouts and more spectrum available

Recent mobile developments



There are now more ways to deliver a voice call

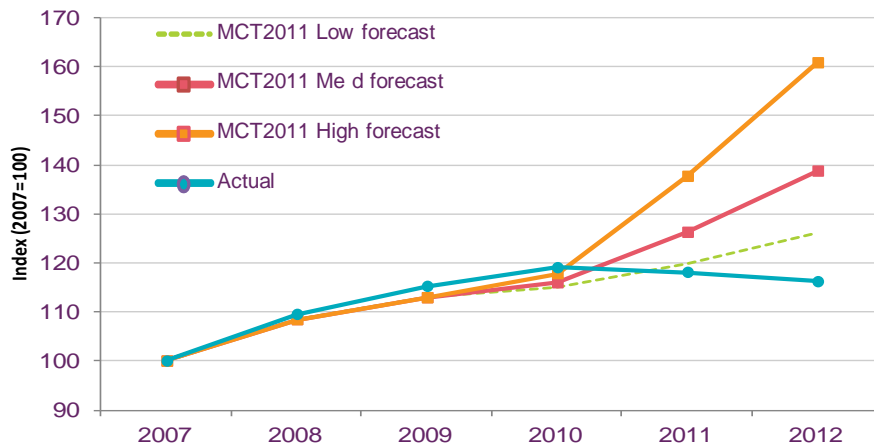
Network and technology development



Mobile voice minutes have declined while data usage has increased rapidly

Recent voice / data consumption trends

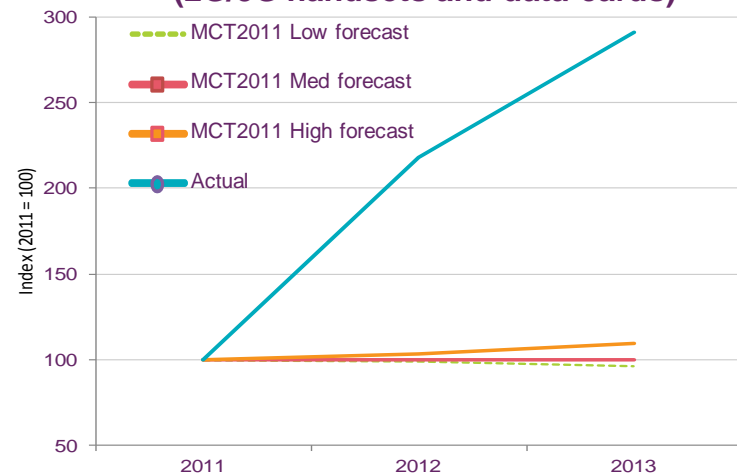
Total voice minutes



Source: 2011 MCT model / Actual from 2013 Ofcom CMR

- Actual voice minutes fell slightly in 2012
- Number of mobile subscribers continued to increase in 2012 (1.3 mobile connections per person in the UK)
- Ownership levels remain stable at 92%

Data usage per subscriber (2G/3G handsets and data-cards)



Source: 2011 MCT model / Actual from Ofcom 2013 Infrastructure Report

- Data use per subscriber increased over 100% in 2012 and 33% in 2013, well in excess of our forecasts in the 2011 MCT model

Increasing data requirements are likely to drive 4G take-up

4G in the UK

Coverage increasing rapidly

- **Today** - EE covers 60% of UK population
- **By Dec 2013** – Three to launch 4G and Vodafone and O2 to cover 13 cities by Dec 2013
- **By end of 2017** - O2 has coverage obligation to provide 98% indoor 4G coverage

Take-up driven by handset availability

- **Awareness** - four in five adults with a mobile phone connecting to internet are 4G aware (only 8% of those subscribe to 4G)
- **Smartphones** - penetration forecast to reach 80% by 2017 [*Enders Analysis*] Currently at 51% [*Ofcom 2013 CMR*]
- **Upgrade** - 30% of smartphone users intend to upgrade to 4G at the end of their current contract

Data heavy usage common on 4G

- **4G subscribers** - tend to be more data intensive users - EE reported usage of 1.4GB/month in Feb 2013 vs 320MB/month for the average data user
- **No voice over 4G yet** - currently no voice traffic carried over 4G, only data
- **Data-caps** may fall away

Ofcom's 2011 definition of mobile termination markets anchored markets to phone number allocations

Market definition

Termination services provided by an individual MCP to another communication provider, for the termination of voice calls to UK mobile numbers which that MCP has been allocated by Ofcom and for which that MCP is able to set the MTR

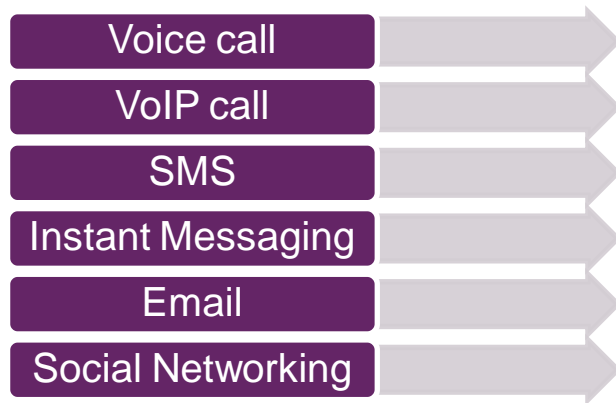
Wholesale MCT markets

We identified 32 separate product markets resulting from 32 MCPs

Will developments in mobile communications require us to revise our market definition for 2015-18?

OTT services

There are many ways to reach someone on a mobile device



Some of these services do not depend on mobile numbers, thus bypassing traditional number-based termination



Does this matter for our consideration of mobile voice calling in 2015-18?

- Smartphone take-up is 51% in the UK today; it was less than 25% on 2010
- VoIP/video and IM is used by a quarter of UK adults weekly
- 44% of OTT users said they use these services to communicate more cheaply
- [From Ofcom CMR]

- In 2015-18, OTT services may substitute for 07x calls in some cases but it seems likely there will be a significant number of calls to 07x numbers for which calling parties will be unable to substitute
- So OTT services seem unlikely to impose a significant constraint on MTRs

For consideration

Preliminary view: OTT unlikely materially to impact on wholesale market definition or market power

In 2011, we found each of the 32 MCPs providing wholesale MCT to have SMP

2011 SMP analysis

Each MCP had 100% share of supply in its Relevant Defined Market

There were very significant barriers to entry

Pricing behaviour consistent with SMP

Fixed CPs did not have sufficient countervailing buyer power (CBP) to constrain the termination rates charged by the 32 MCPs

For consideration

Preliminary view: no evident change in MCT markets to suggest SMP analysis should be different

We will review the current set of remedies

Remedies applied in 2011

| SMP Condition | Description | Applied to |
|---------------|--|--------------------|
| M1 | Provide access on reasonable request on fair and reasonable T&Cs including charges | All MCPs |
| M2 | No undue discrimination | Four national MCPs |
| M3 | Charge control | Four national MCPs |
| M4 | Publish charges | All MCPs |

We adopted a LRIC cost standard for the price cap

Assessment of cost standards

Framework for assessment:

- Economic efficiency
- Competitive impact
- Effect on “vulnerable” consumers
- Commercial and regulatory consequences



Predictions of the impact on:

- Mobile retail prices
- Penetration and usage charges
- Fixed retail prices
- Investment by mobile operators
- Competition



For consideration

Preliminary view: our starting assumption is that it is likely to be appropriate to adopt LRIC for 2015-2018, subject to consideration of emerging evidence to the contrary

We will also review the remaining conditions

Questions on remaining conditions

For consideration

“Fair and reasonable” approach
for smaller operators

- Has it been effective?
- If not, should we extend a charge control to smaller operators too?

Non-discrimination obligation

- Would there be consumer harm if operators chose to price below the cap in some cases?

Requirement to publish
charges

- Has it been effective?
- If not, should we consider a different option?

Contents – Charge Control

- Summary of approach in MCT 2011
- Network and technology choices for the model
- Traffic forecasts
- Modelling of costs
- Issues of implementation, e.g. charge control design

The aim of our model is to estimate the cost of termination for an efficient hypothetical operator

Summary of approach in MCT 2011

| | |
|------------------------------|--|
| Model type | <ul style="list-style-type: none"> • Bottom-up cost model • Calibrated using top-down information |
| Network technology | <ul style="list-style-type: none"> • 2G in the 1800 MHz band • 3G (including HSPA) in the 2.1 GHz band |
| Network build drivers | <ul style="list-style-type: none"> • Number of subscribers (2G, 3G) • Coverage requirements • Traffic generated (voice and data) by 2G and 3G subscribers |
| Cost drivers | <ul style="list-style-type: none"> • Used to calculate the required deployment of 2G, 3G and HSPA network to meet capacity and coverage required ahead of time |
| MCT costs | <ul style="list-style-type: none"> • Calculated based on LRIC • also able to calculate LRIC+ |

Contents – Charge Control

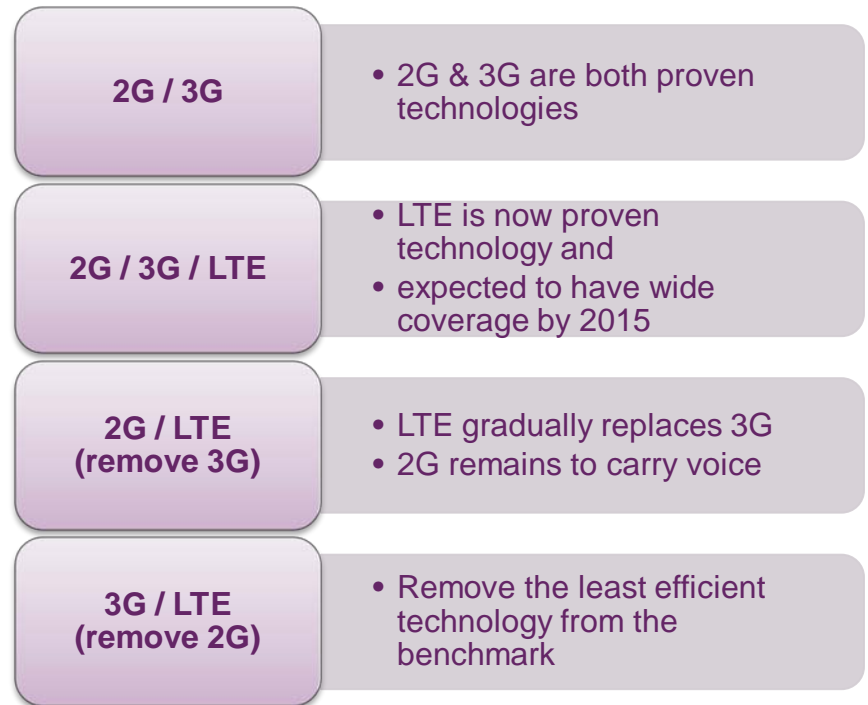
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We are considering what technologies to include in our cost model

Current approach

- We currently model a mixture of 2G and 3G technologies
- We do not plan to change the historic use of technologies
- However, we need to consider what will happen to these technologies during the explicit modelling period

Possible technology mixes for next review



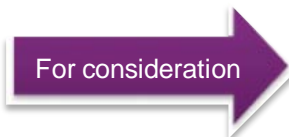
For consideration

What approach do you think we should take in our model and why?

We will consider incorporating solutions that may increase capacity or reduce costs

Possible technology additions to our model

| Technology | Position in 2010/11 MCT | Provisional position for 2015 MCT |
|----------------------------------|---|--|
| Capacity upgrades | We modelled a gradual upgrade of capacity using HSPA versions | We are proposing to use a similar approach for further 3G and LTE capacity enhancements |
| Femtocells | Femtocells excluded from model as technology was new | We will consider including Femtocells in the model as over 200k Femtocells are now deployed <i>[source: Ofcom Infrastructure report 2012]</i> |
| Micro-/Small- cells | Microcells' deployment was limited | We will review the take up of micro-/small- cells |
| WiFi Offload | Not included | We expect WiFi Offload to affect our traffic projections. |
| Multi-Base station cells (S-RAN) | Not included | We will consider the effect technology upgrades may have on costs |
| VoLTE | VoLTE was not an option | Inclusion subject to a) operator deployment evidence; b) VoLTE traffic forecasts; and c) material impact on LRIC |

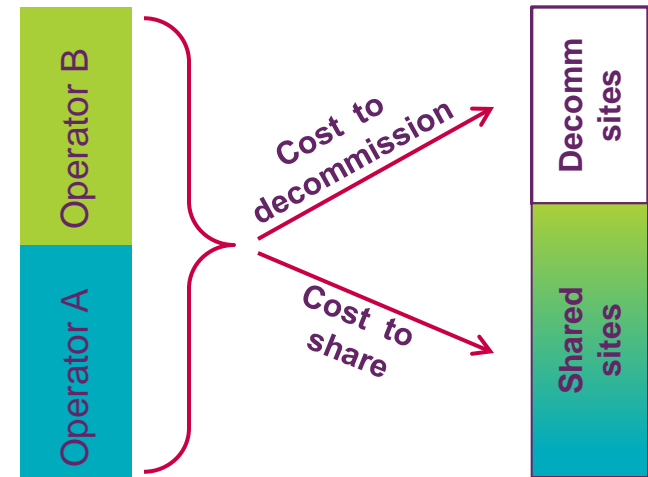


- Do you agree with our approach?
- Do you think we should include the above technologies in our model?
- Are there more technology developments we should consider?

More network sharing in the UK by 2015

RAN sharing

- There are two RAN sharing agreements in the UK
 - MBNL, joint venture between EE and Three
 - Project Beacon (CTI Ltd), joint venture between Telefónica UK and Vodafone
- Network sharing can be a combination of:
 - Shared cell sites
 - Shared active RAN equipment but dedicated spectrum for each operator
 - Shared backhaul infrastructure, but dedicated capacity for each operator
 - Competition in the core network and offered services
- Impact of RAN sharing modelled by halving the capex and opex of shared assets
- Alternatively, we could assume two networks, in the long run, with equal market shares



For consideration

How do you think we should capture network sharing in our model?

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Our forecasts will be informed by a number of sources

Introduction

- The traffic forecasts used in the model are driven by subscriber numbers and usage per subscriber (2G/3G/4G). In 2011 we distinguished between handset users and data-card users.
- We are in the process of sending out section 135 requests to MNOs to help inform our forecasts used in the modelling. We will use these to produce low, medium and high forecasts in the consultation.
- Expected key drivers of future traffic:
 - Total voice minutes
 - Data volumes from handsets and datacards (i.e. non-handset devices with SIMs).

Our model will take into account changes in traffic patterns and consumer behaviour

Traffic forecasts in the model

Mobile voice minutes

- We noted that, differently from our forecasts, mobile voice minutes have declined in 2011 and 2012
- However, in the 2011 MCT model, traffic assumptions had relatively little impact on the LRIC outputs.

Data usage

- We noted that growth of data usage per subscriber has slowed down to 33% in 2013 from above 100% in 2012 – but is in excess of our forecasts in the 2011 MCT model.
Source: 2013 Ofcom Infrastructure Report – Source Operators
- The 2011 MCT model distinguished between handset users and data-card users due to their different usage patterns

For consideration

Do you think the downward trend in mobile voice minutes will continue in 2015-2018?

For consideration

Should we continue to distinguish between handset and data-card users for the forward-looking period of this charge control?

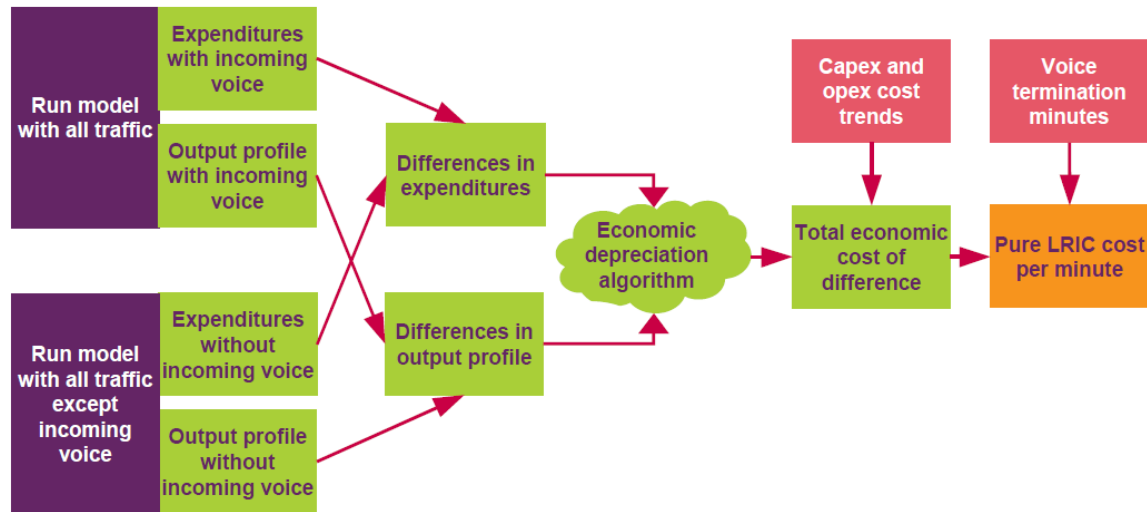
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We propose to maintain a decremental approach to calculating LRIC

Calculation of LRIC

- The 2011 MCT model used a 'decremental approach', consistent with EC Recommendation:



For consideration → Preliminary view: we propose to maintain this decremental approach

Our 2011 modelling allows the identification of key drivers of the LRIC of MCT

Key drivers of LRIC results

- The LRIC results of the 2011 MCT model were found to be relatively insensitive to:
 - Demand forecasts
 - Site sharing assumptions
 - Market share
- More influential inputs and assumptions were:
 - Technology (2G/3G or 3G only)
 - WACC
 - Equipment unit costs, trends, capacities, utilisation (used for model calibration)
- LRIC results are also dependent on the extent to which equipment deployment is driven by call termination traffic volumes

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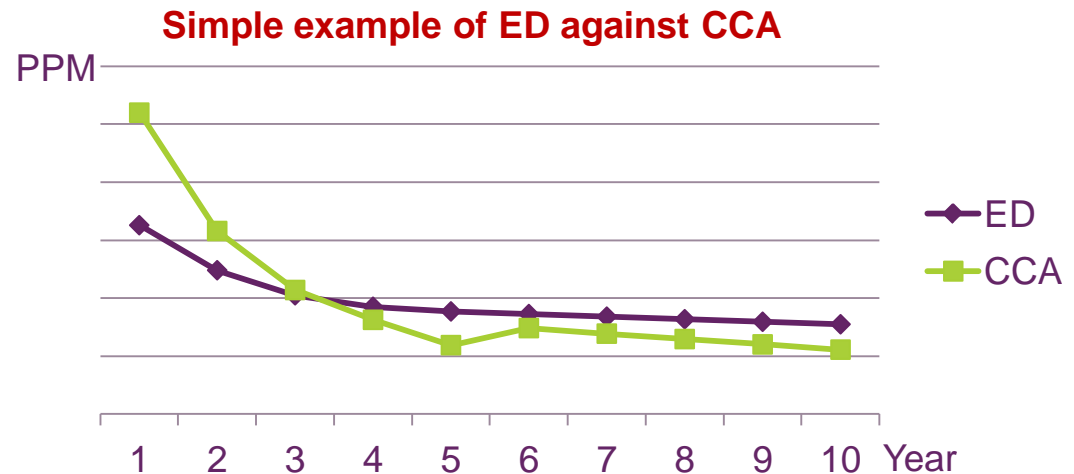
For consideration

Preliminary view: we propose to focus our attention on the key drivers of the LRIC results

We propose to maintain the use of economic depreciation

Economic depreciation

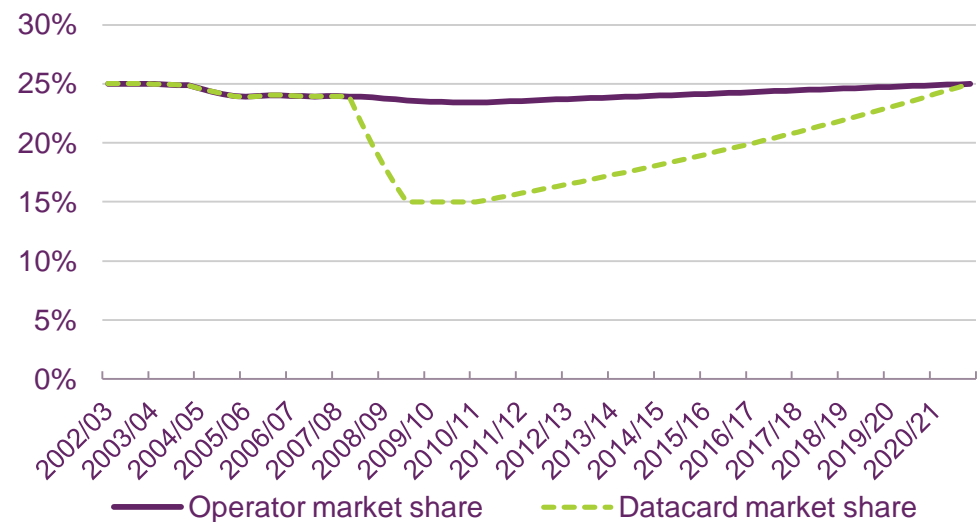
- Original Economic Depreciation seeks to set efficient price signals by determining the path of prices in a benchmark competitive market
- Unit costs do not depend on the level of utilisation at that point in time, but on the level of utilisation achieved over the lifetime of the network
- The shape of the ED unit cost profile is dependent on input cost trends only
- Use of ED consistent with the EC Recommendation. Our preliminary view is to maintain the use of Original ED.



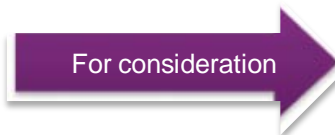
The 2011 MCT model allowed market share to vary over time

Market share of the hypothetical operator

- EC Recommendation cites 20% as the ‘minimum efficient scale’, but allows deviation if market conditions suggest this is appropriate
- 2011 MCT model reflected market developments:
 - Fell from 25% following entry by H3G
 - Trended back to 25% after creation of EE
- Following CC Determination, used a separate market share for data-cards
- Note that the LRIC results were insensitive to changes in market share



Source: 2011 MCT model



- What market share should we use?
- Should we use the same market shares for every service?

Calibration is an important part of the modelling process

Model calibration

- As in previous MCT modelling, we propose to calibrate the 'bottom-up' model using 'top down' information (a 'hybrid approach'), as envisaged in the EC Recommendation
- In order to ensure the model is reasonably aligned to MNOs' actual costs in historical years we compare model outputs with MNO data on:
 1. Quantities of key types of network equipment
 2. Accounting cost information
- Then adjust relevant model parameters to calibrate the model to an average efficient national MCP

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For consideration

Preliminary view: we propose to focus on GBV (rather than NBV), opex and key asset counts, over multiple years

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In addition to the cost modelling, we will also need to consider issues relating to charge control design

Our preliminary views on charge control design

For consideration

Glide-path or set rates at LRIC for each year of control?

- Setting MTRs at LRIC for each year of the control fits most closely with the EC Recommendation.
- However, this could result in a less smooth path of MTRs (i.e. different values of X in the charge control formula).

Treatment of inflation

- Our recent WLR/LLU consultation proposed a charge control formula using CPI inflation.
- We propose to use CPI for the MTR cap.
- We could also simplify the model by calculating in nominal terms.

Q&A

Next steps

- Written responses following today's workshop to reach Ofcom no later than Wednesday, 20 November 2013. To be sent to MobileTermination2015@ofcom.org.uk Cc: valeria.baiamonte@ofcom.org.uk
- If you want to meet us, we can arrange bilateral meetings
- We plan to organise a stakeholder workshop in January to discuss our cost model
- The team will then be working to publish a consultation in May 2014