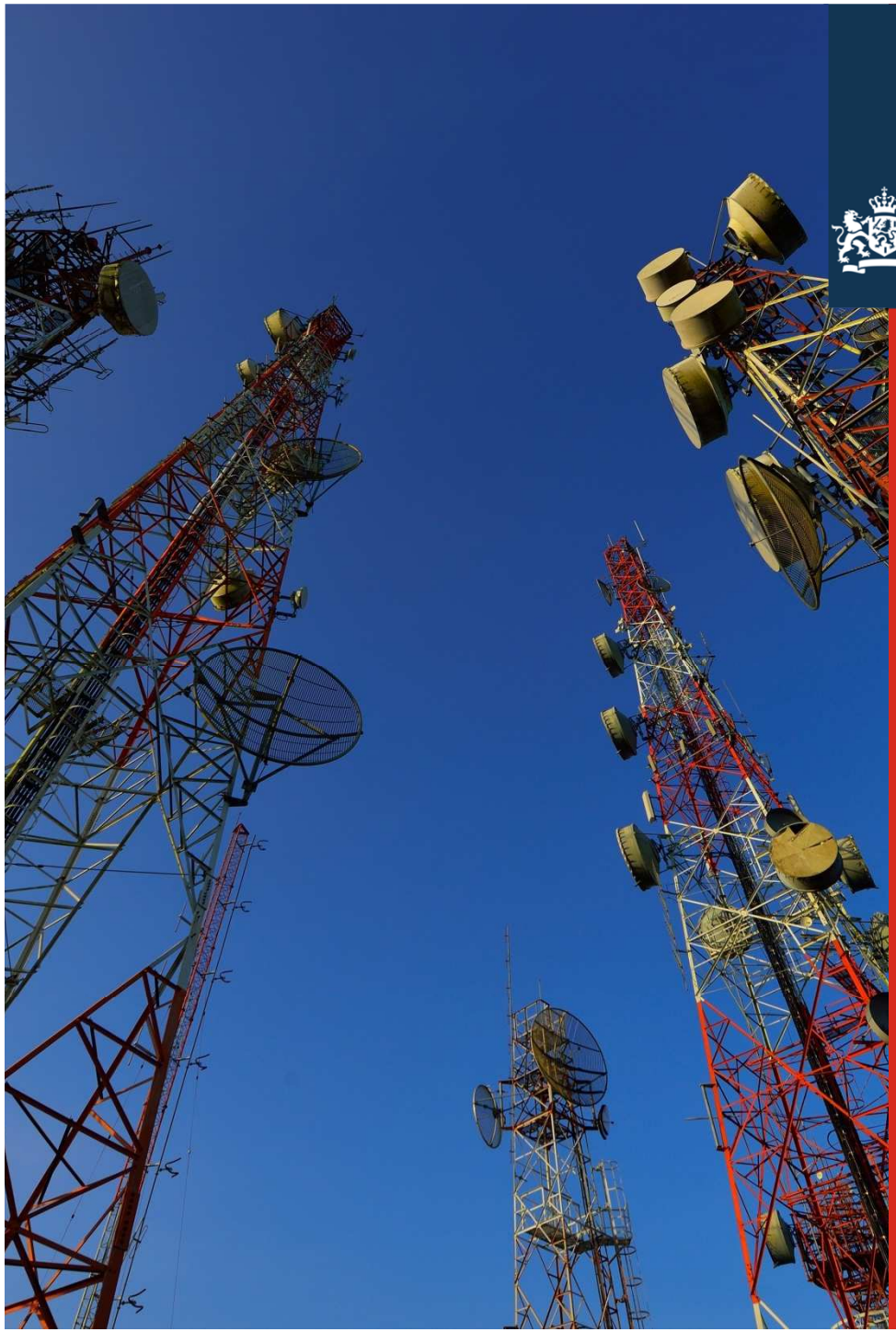


Netherlands
Radiocommunications Agency
Ministry of Economic Affairs

The need for 'over the air' antenna performance requirements in European product regulation

importance of developing 3GPP OTA antenna performance specifications

Jean-Paul van Assche

3GPP RAN-WG4/5 meeting, May 2016

Introduction

Netherlands Radio Communications Agency

- National authority for radio spectrum in NL,
- European Radio Equipment regulation
- 280 employees
- Offices in Groningen and Amersfoort (NL)
- Part of the Ministry of Economic Affairs

Jean-Paul van Assche

- Senior advisor
- Radio equipment regulation,
- Standardisation (CENELEC, ETSI)

Contents

- Current European product regulation for radio-equipment: *no obligatory receiver requirements*

- Impact of ‘poor’ mobile phone ‘over the air’ (OTA) receiver sensitivity on connectivity in the Netherlands

- New European product regulation for radio-equipment: *receiver requirements become obligatory*

- Urgent need for a technical specification on OTA antennaperformance (head/hand effects)

Current European regulation for radio equipment (European R&TTE directive)

- Public interest requirements like EMC, EMF, radio interface

- Under the R&TTE directive <u>no (or limited) obligatory receiver requirements apply</u> for radio equipment

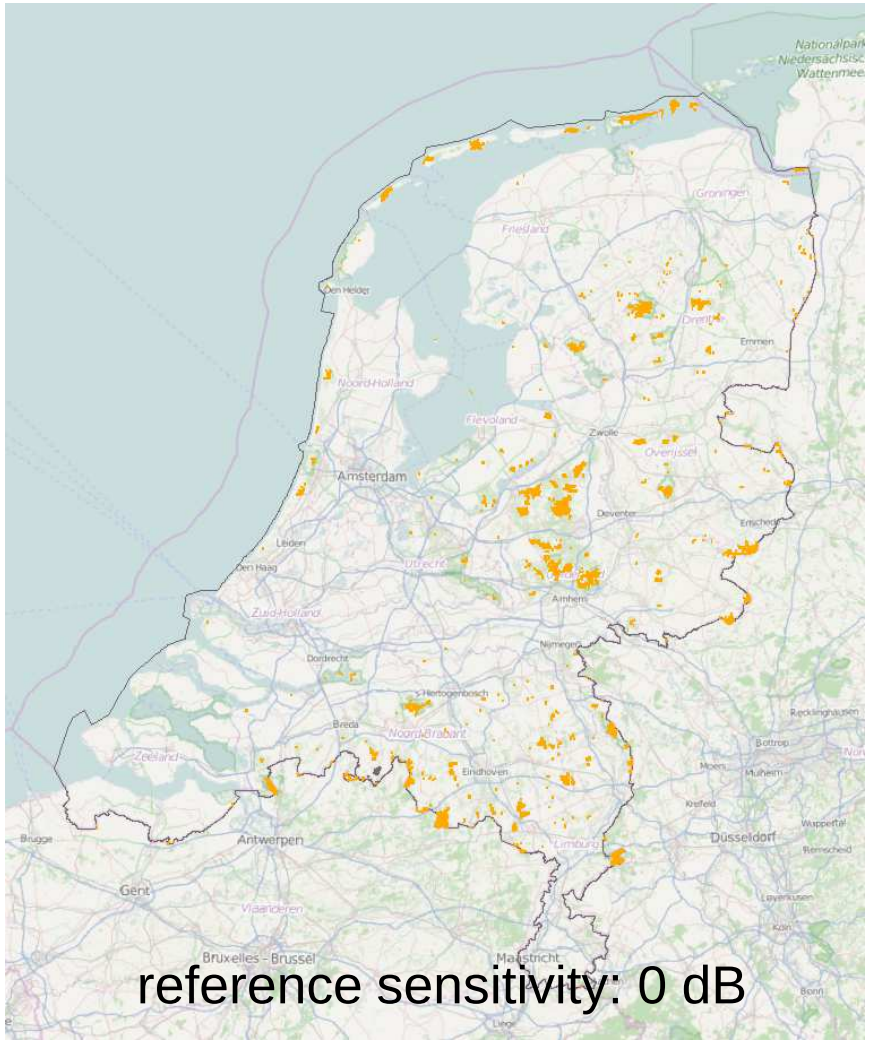
- As a consequence, the various mobile phones that appear on the European market largely differ in receiver (antenna) performance

(sources:
Mobile Phone Antenna Performance 2013, University Aalborg,
MOBILE HANDSET TESTING, 2015 Ofcom)

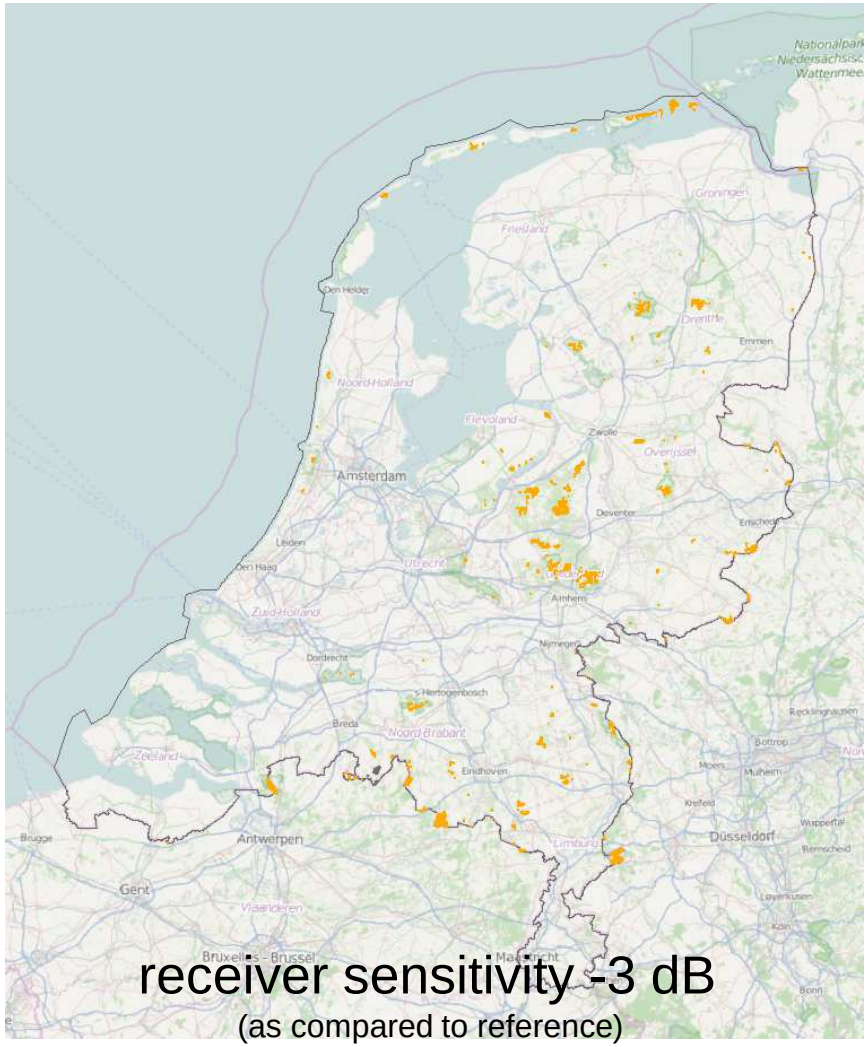
Theoretical mobile connectivity in the Netherlands with a 'reference' mobile phone

<u>Orange spots:</u>
Locations where the probability for successfull mobile connection (to 112 emergency service) with a reference mobile phone via at least one of the following techniques is lower than 99%.

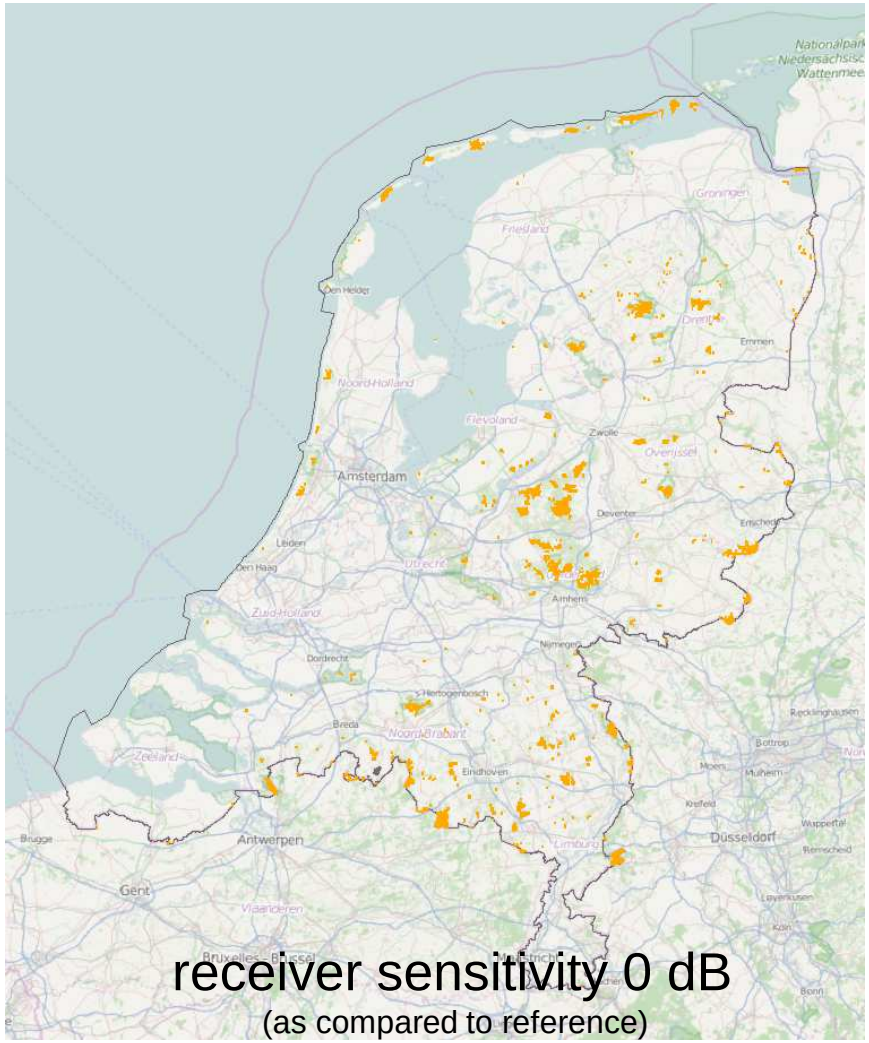
Theoretical reference mobile phone	
Technique	OTA sensitivity
GSM 900	-95 dBm
GSM1800	-100 dBm
UMTS 900	-103 dBm
UMTS 2100	-108 dBm



Areas with mobile connectivity probability < 99%



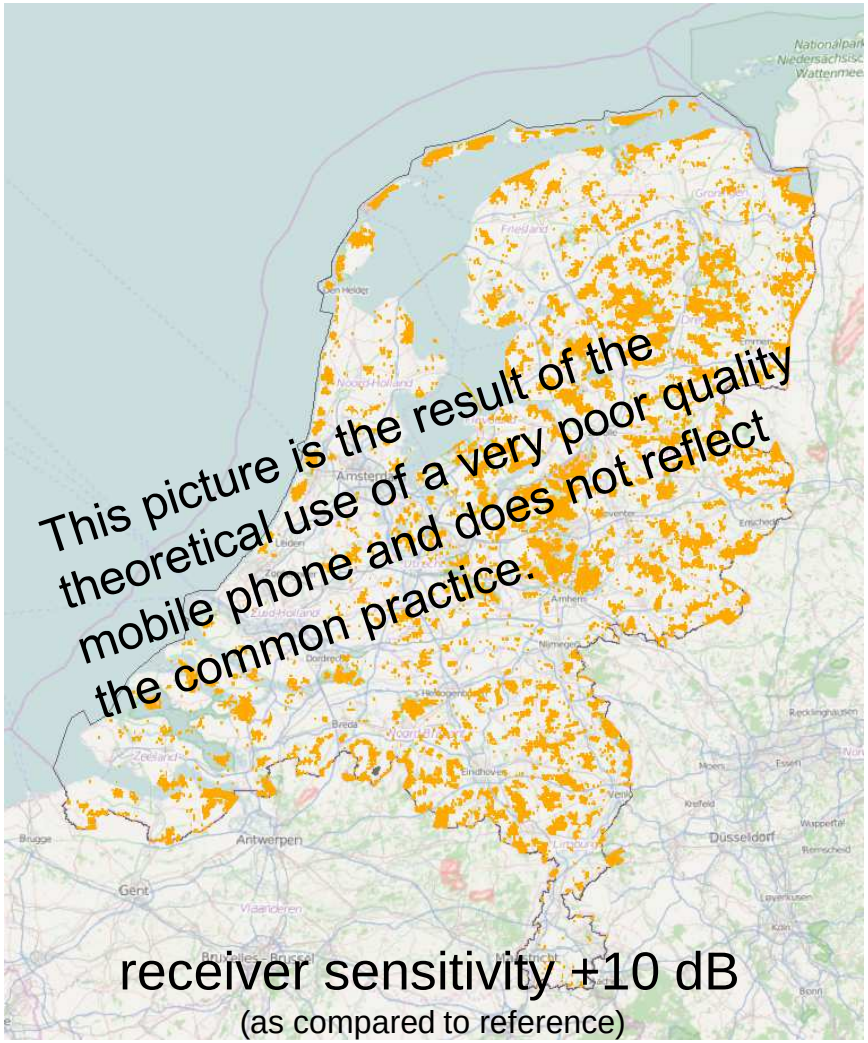
receiver sensitivity -3 dB
(as compared to reference)



receiver sensitivity 0 dB
(as compared to reference)

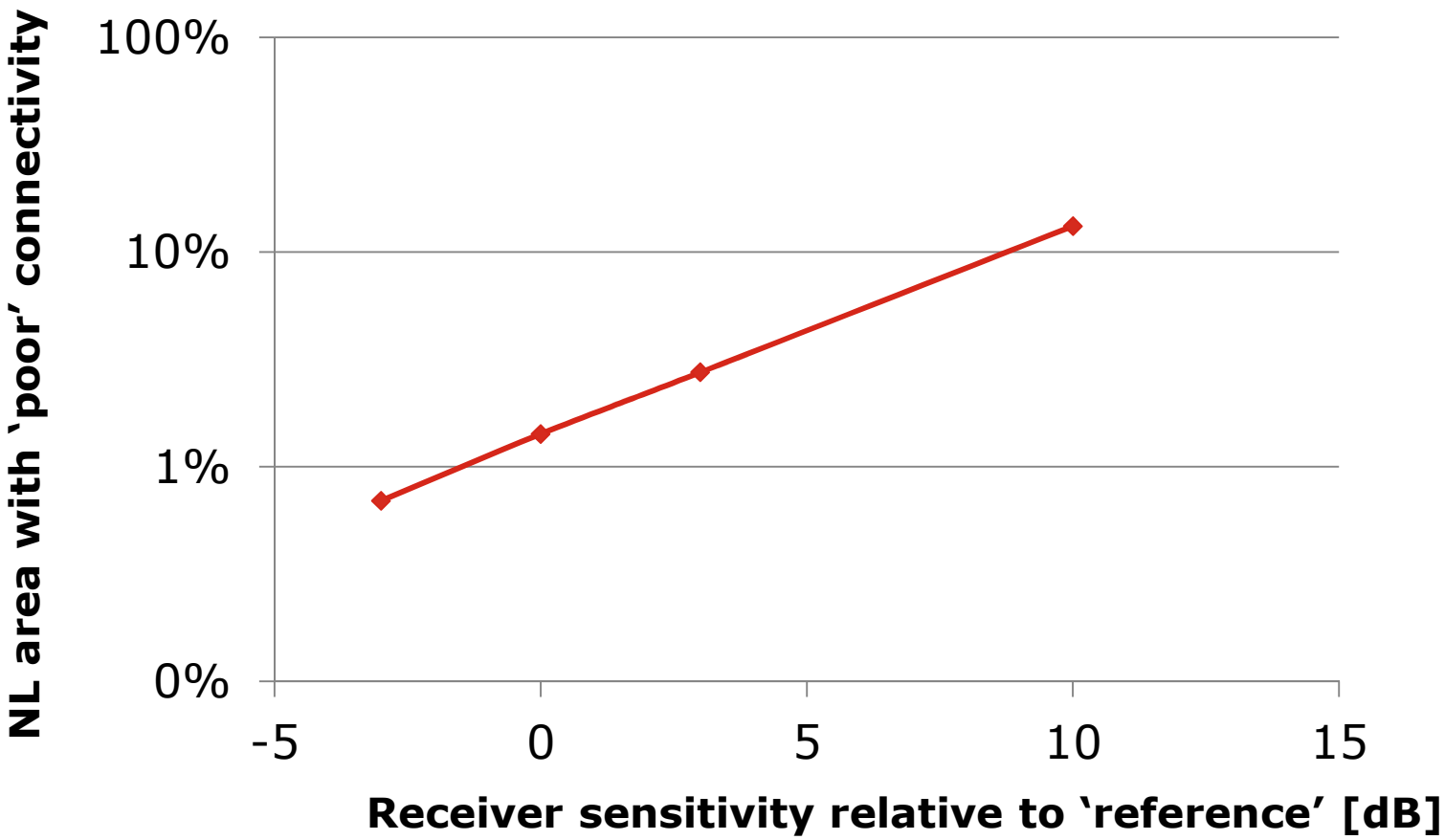
Areas with mobile connectivity probability < 99%

receiver sensitivity +3 dB
(as compared to reference)



receiver sensitivity +10 dB
(as compared to reference)

Percentage of NL area with mobile connectivity probability < 99%



Impact of low receiver performance

- A few dB's less receiver sensitivity has a large impact on the connectivity.
- Measurements show that head and hand effects can deteriorate the sensitivity with more than 10 dB.

New European regulation for radio equipment (Radio Equipment Directive)

- The new regulatory regime Radio Equipment Directive (RED) will replace the R&TTE directive.

- It will be in force from 13 june 2016 and will be obligatory from 13 june 2017.

➡ ***Receiver requirements become obligatory in Europe!***

Need for adequate harmonised ETSI standards

- The Netherlands authority has the opinion (also supported by several other member states) that ETSI standards (under the RED) shall take into account antenna performance requirements including hand and head effects.

- A technical specification delivered by 3GPP could be copied in a future version of the harmonised ETSI standards for mobile phones (eg. ETSI EN 301 908-13 for LTE)

Conclusion

- The antenna performance has a large impact on the mobile connectivity.
- A good mobile phone antenna performance contributes to a better connectivity
- New European Radio Equipment regulation (obligatory from 13 june 2017) demands manufacturers to take into account receiver requirements
- Need for a technical specifications (limits and measurement method) for GSM, UMTS and LTE - OTA antenna performance assessement (including head and hand effect) to be copied in ETSI harmonised standards.

Thank you for your attention!

Questions?

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