AON

Storm Kyrill sensitivity analysis

Oasis Insight Conference

25 September 2025

Proprietary & Confidential

Agenda

1

Approach & methodology

2

Results

3

Conclusions

1

Approach and Methodology

Question(s)

From the regulator or your internal management

What if last week's storm was different?

- Were we lucky or unlucky? Was it a close call?
- What is more dangerous, a different track or stronger windspeeds?
- What is the sensitivity of our business in the shape/intensity of the event footprint?
- How can we simulate the impact of reasonable footprint variations on our portfolio?

Approach

- Let's take the footprint of a known storm and build multiple variations accounting for different factors such as:
  - Change the position of the storm: **north-to-south**, **east-to-west**.
  - Change the **intensity** of the footprint.
- We better **keep it simple**, the larger the differences, the larger the deviation from reality.
  - Shift station locations by 50km and 100km
  - Increase/decrease all gusts of the storm with the same ratio
- Finally, we introduce the new footprints in the model and calculate the losses.
  - Scenarios modelled on PERILS market portfolio 2023

Historical hazard

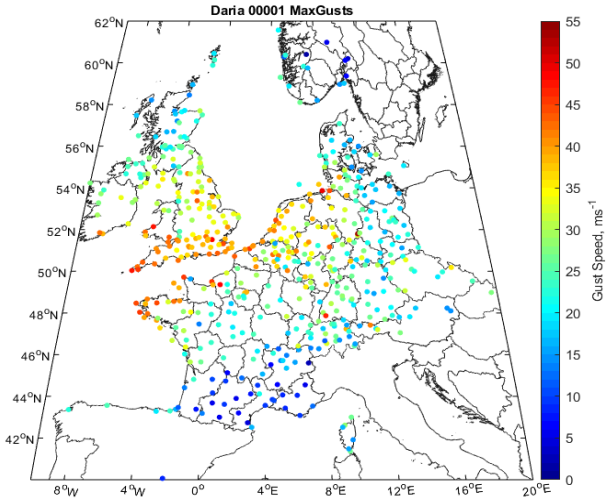
How we build the footprints?

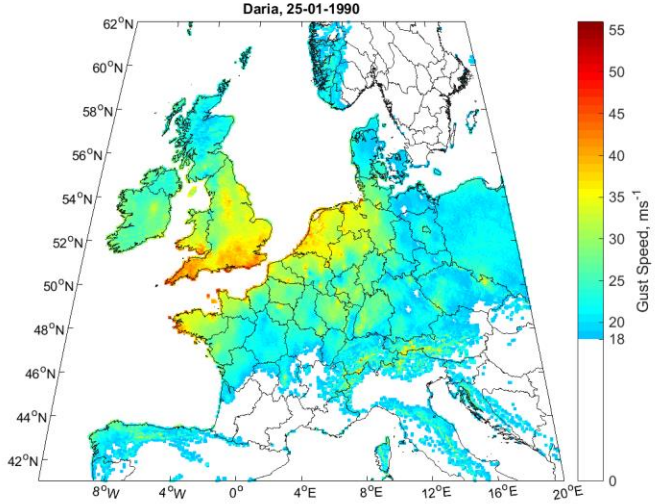
Data

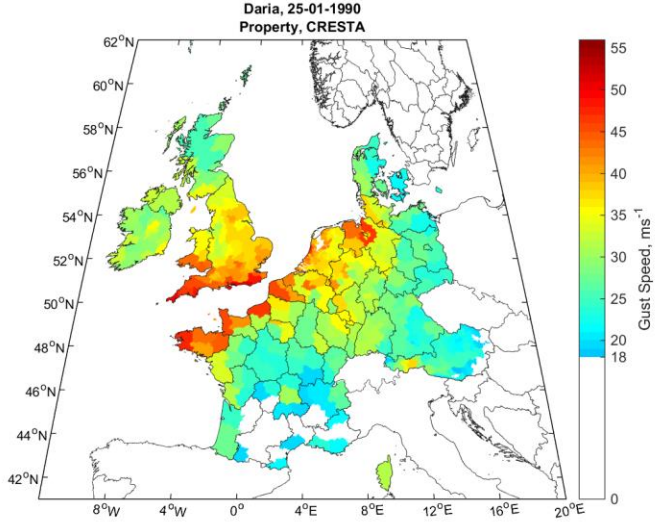
- All historical footprints are based on the maximum daily gusts from the British Met Office, KNMI (Dutch Met Office), DMI (Danish Met Office), the Swedish Met. Office and Euro-tempest

In a nutshell:

- the gust observations (usually WMO stations) are interpolated on a 7km grid
- The gridded gusts are converted into hazard distribution within the administrative units defined in the model
- The footprints are implemented in ELEMENTS





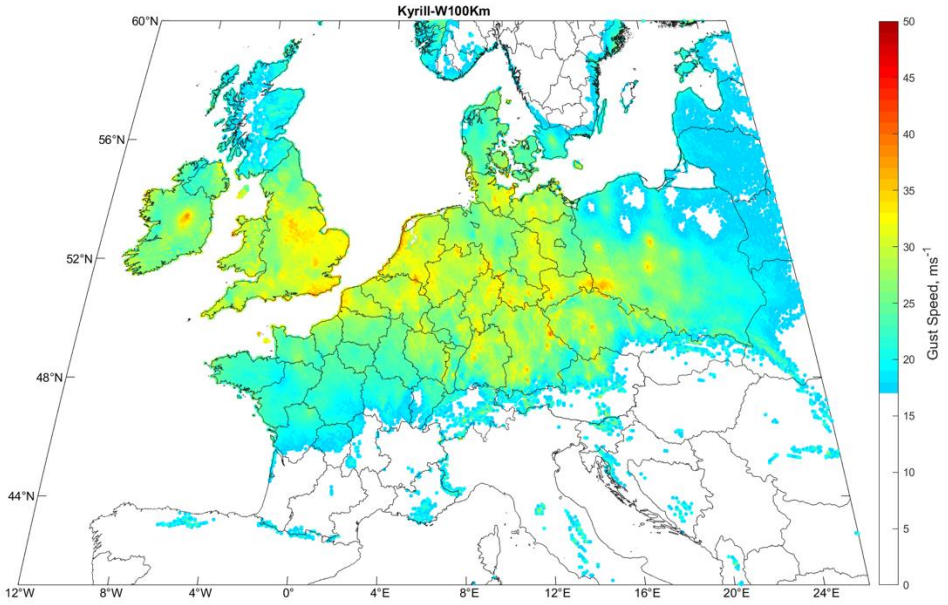


2

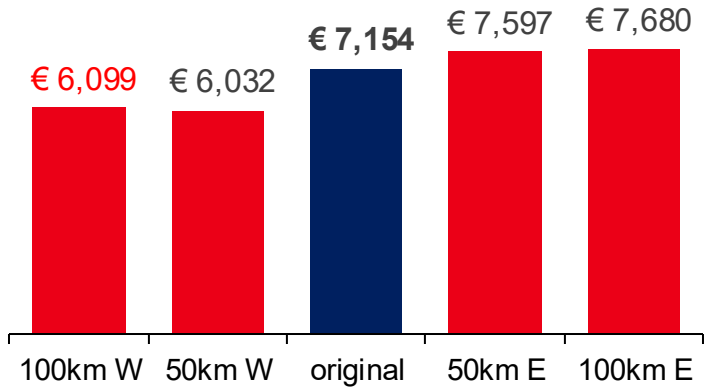
Results

West-to-East shift

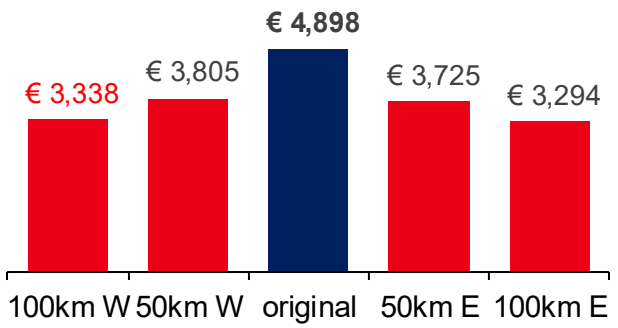
100km W | 50km W | Original | 50km E | 100km E



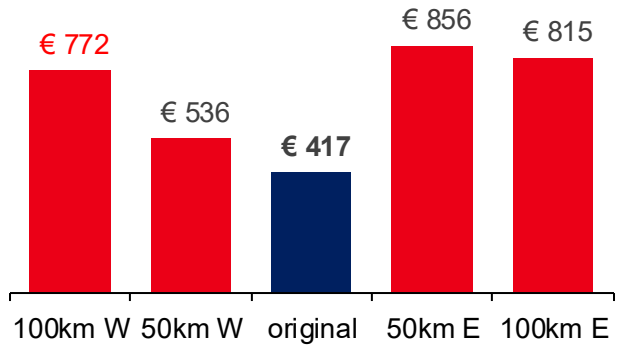
EU - Zonal variations (in millions)



DE - Zonal variations (in millions)

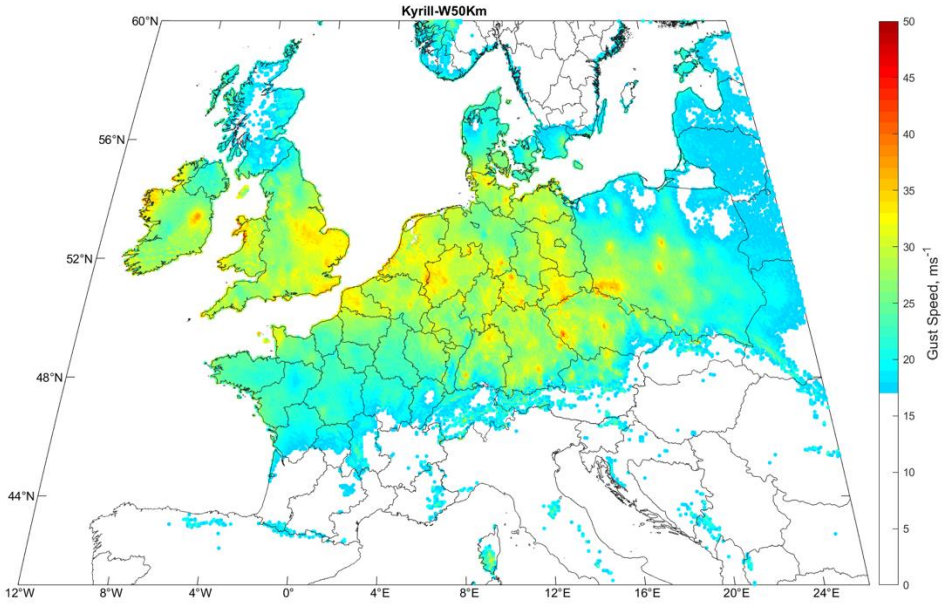


UK - Zonal variations (in millions)



West-to-East shift

100km W | **50km W** | Original | 50km E | 100km E



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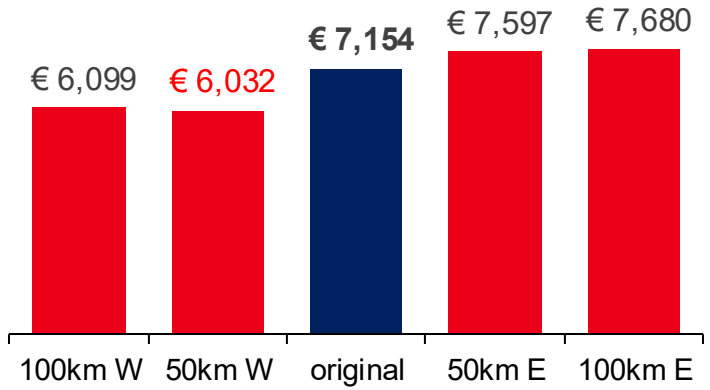

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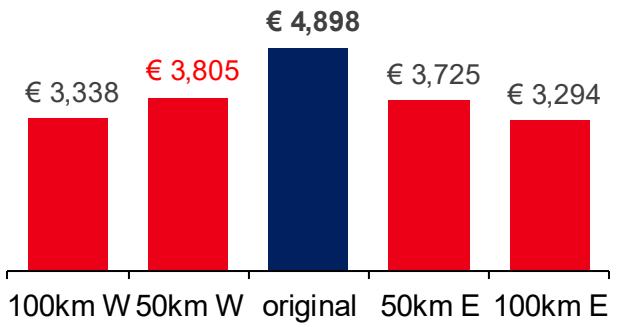

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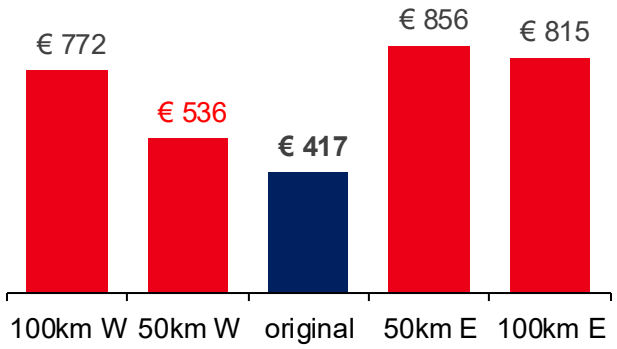
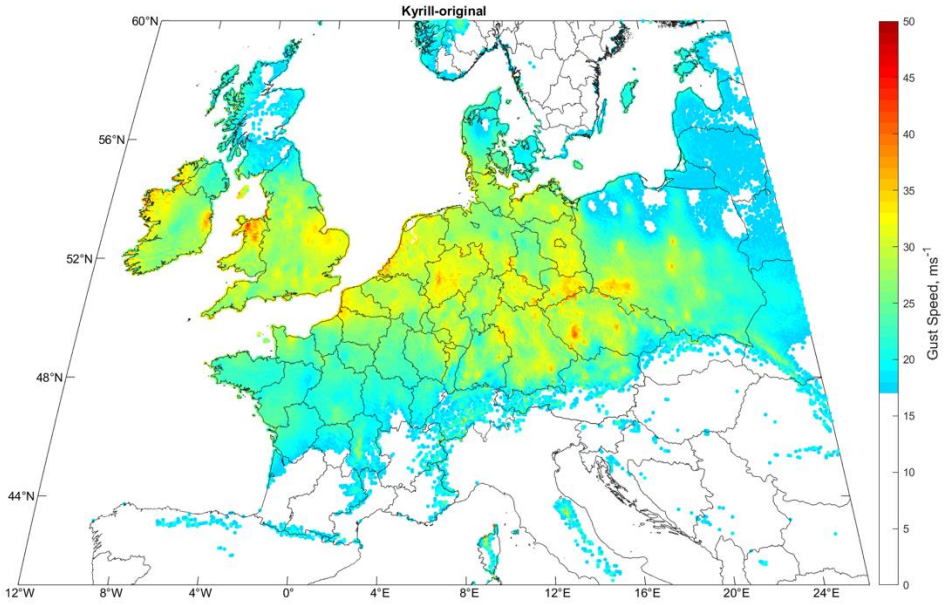


West-to-East shift

100km W | 50km W | **Original** | 50km E | 100km E



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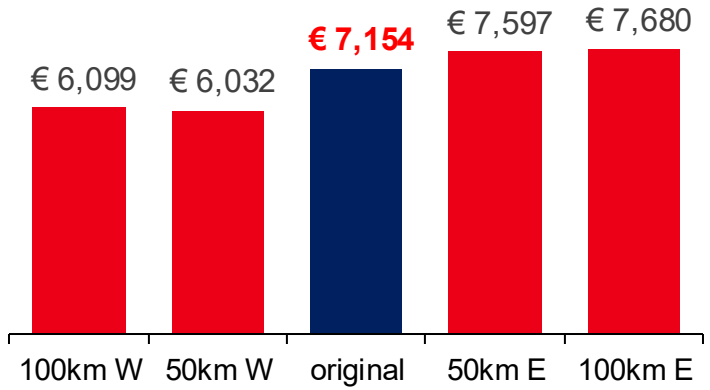

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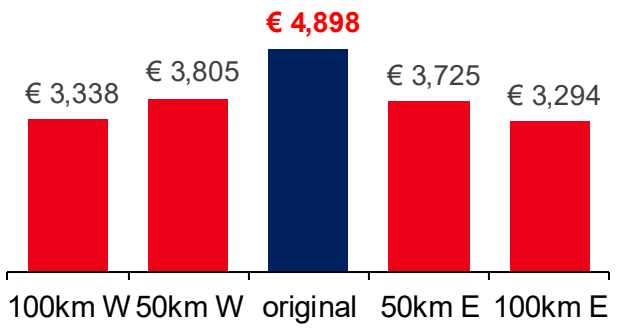

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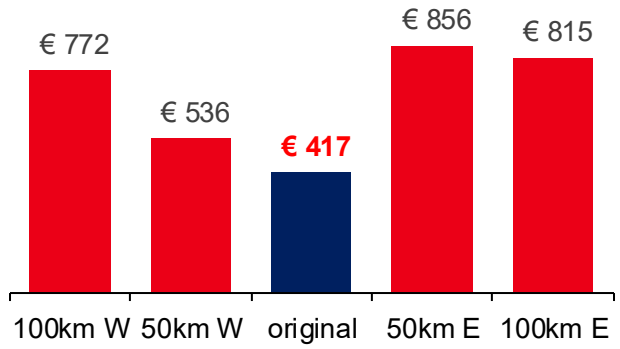
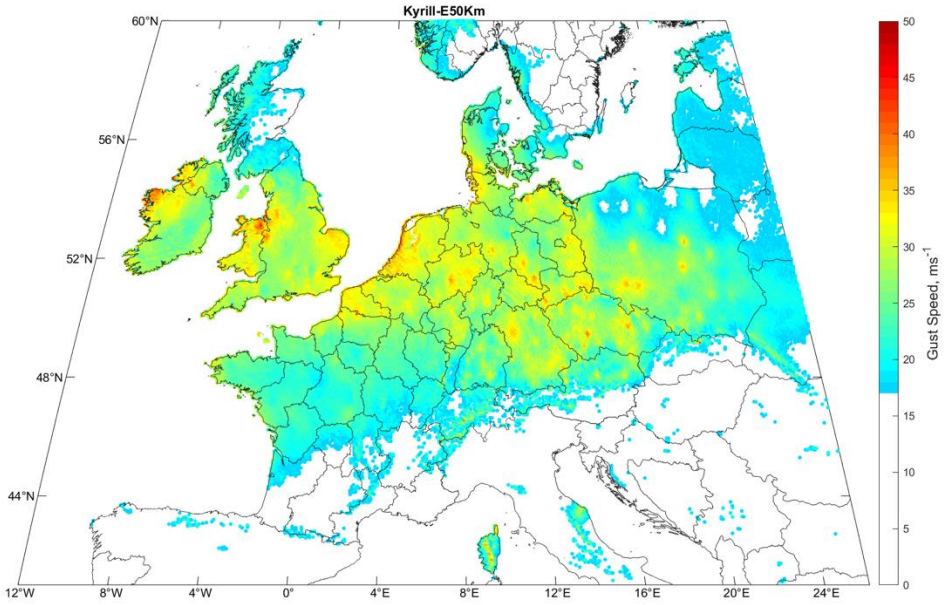


West-to-East shift

100km W | 50km W | Original | **50km E** | 100km E



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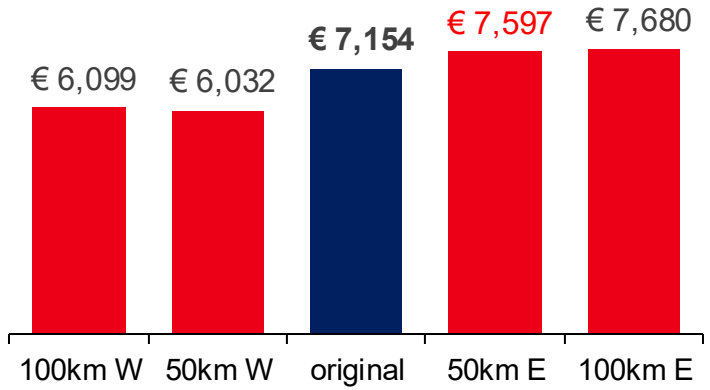

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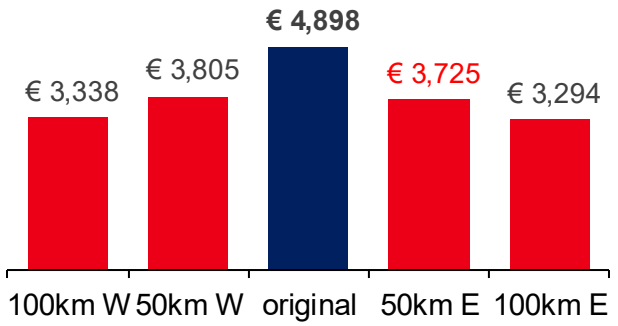

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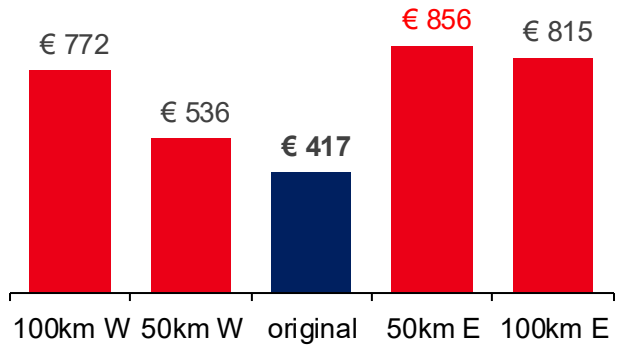
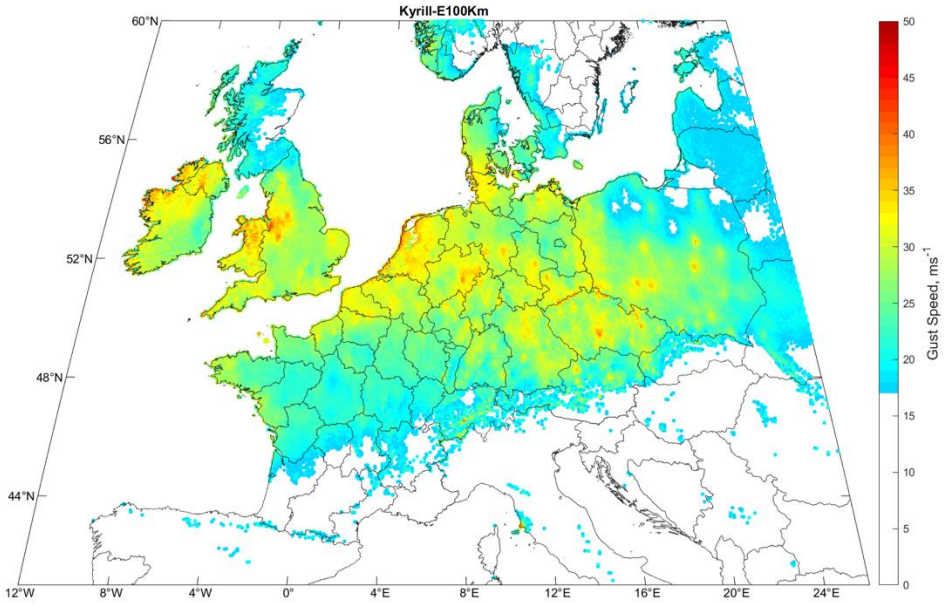
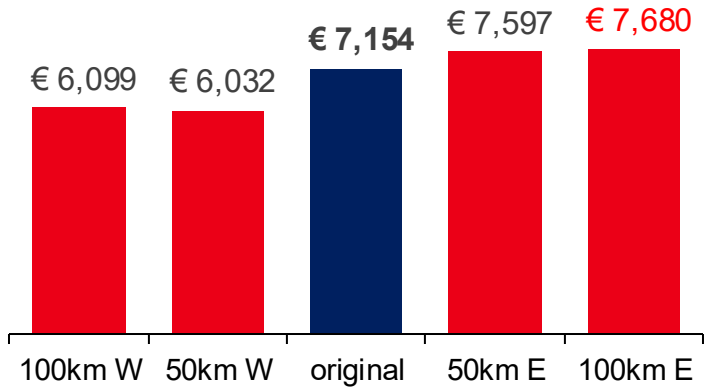


West-to-East shift

100km W | 50km W | Original | 50km E | **100km E**



EU - Zonal variations (in millions)



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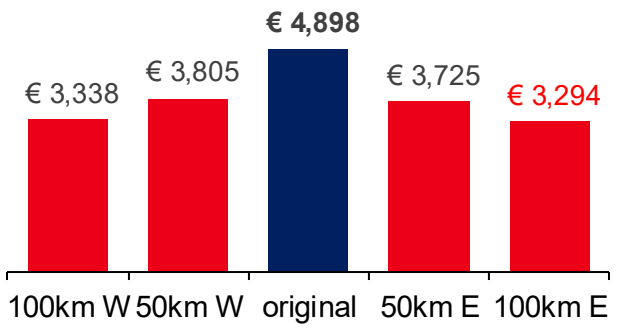

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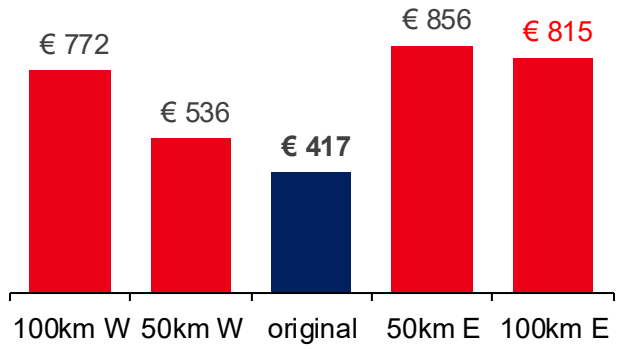
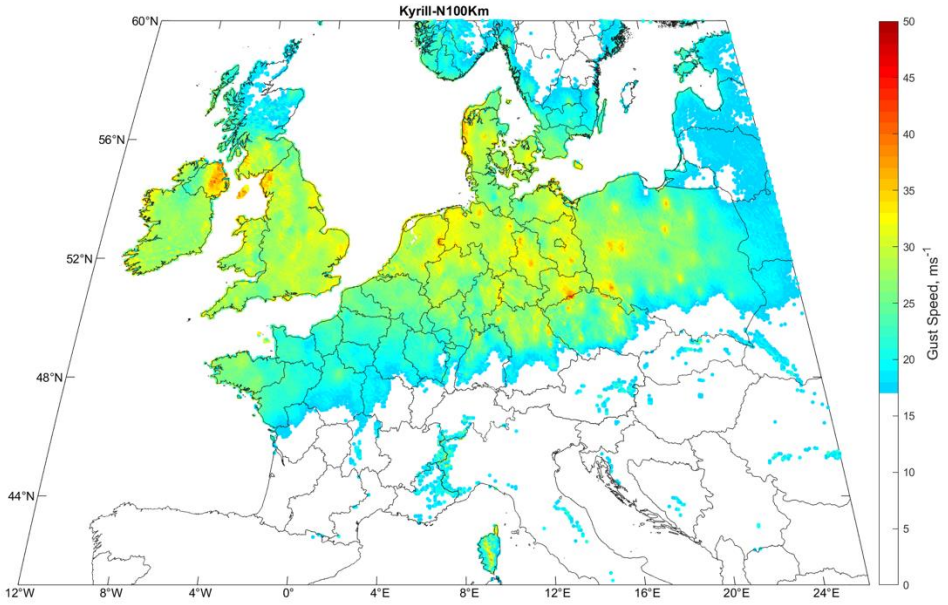
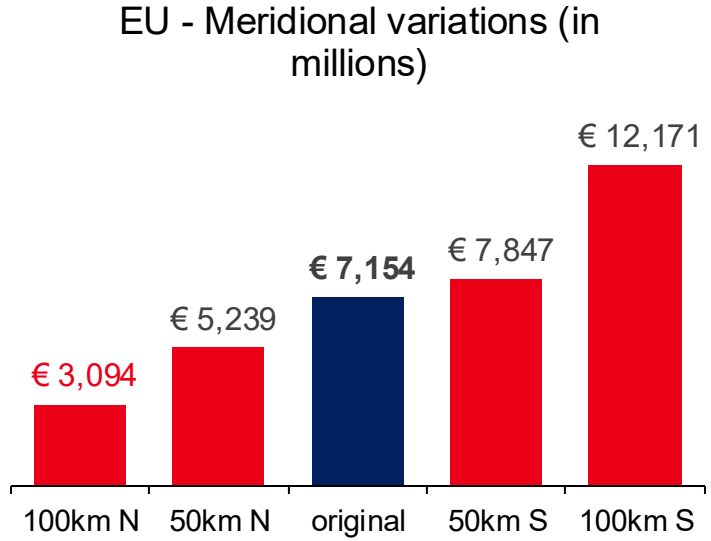
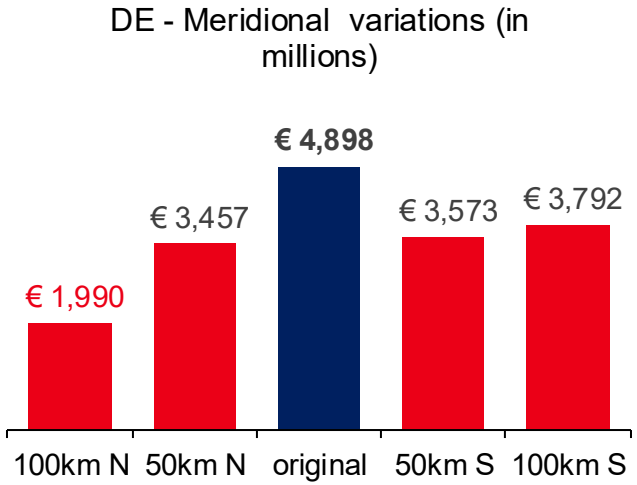


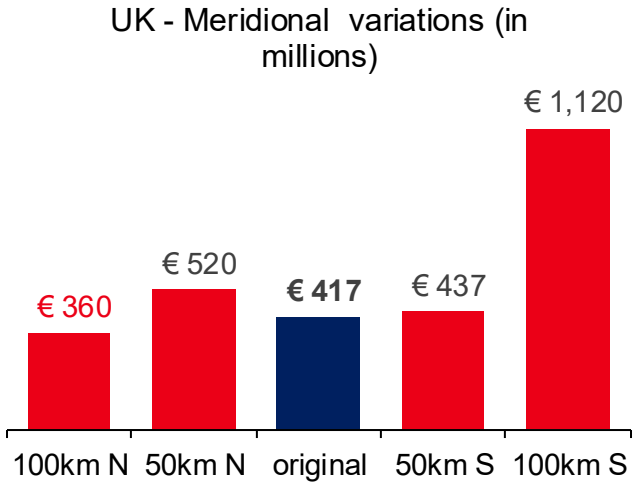
North-to-South shift

100km N | 50km N | Original | 50km S | 100km S



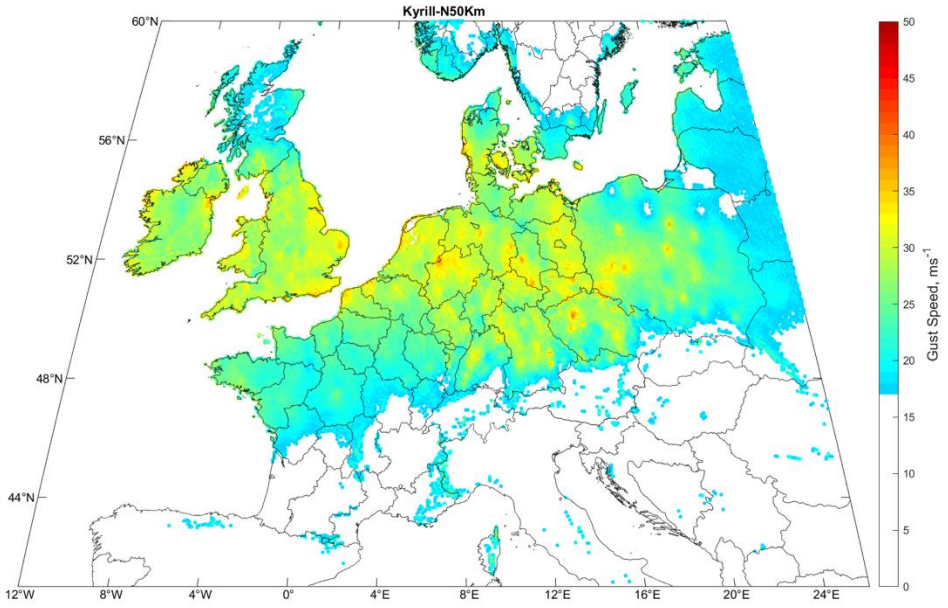




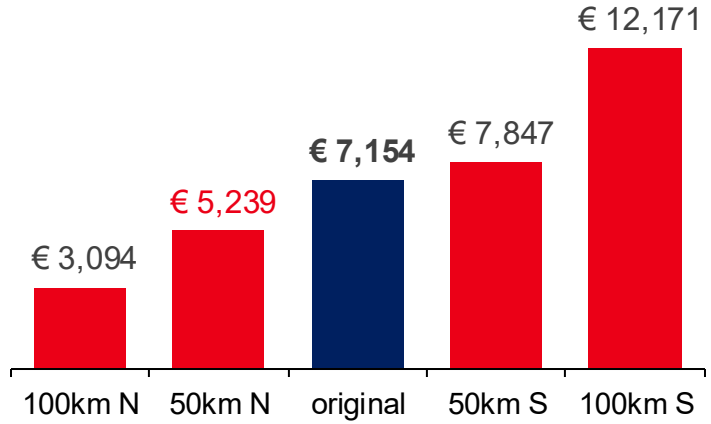


North-to-South shift

100km N | **50km N** | Original | 50km S | 100km S



EU - Meridional variations (in millions)



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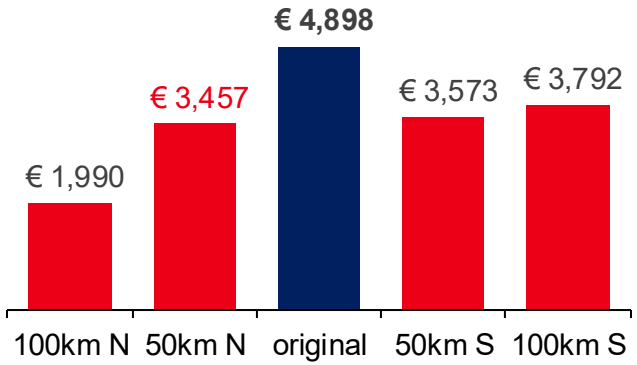

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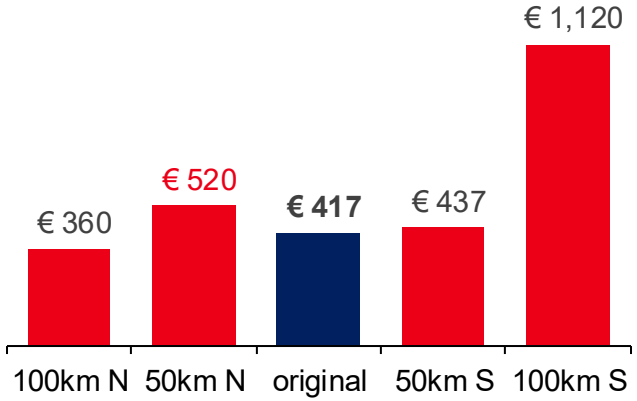
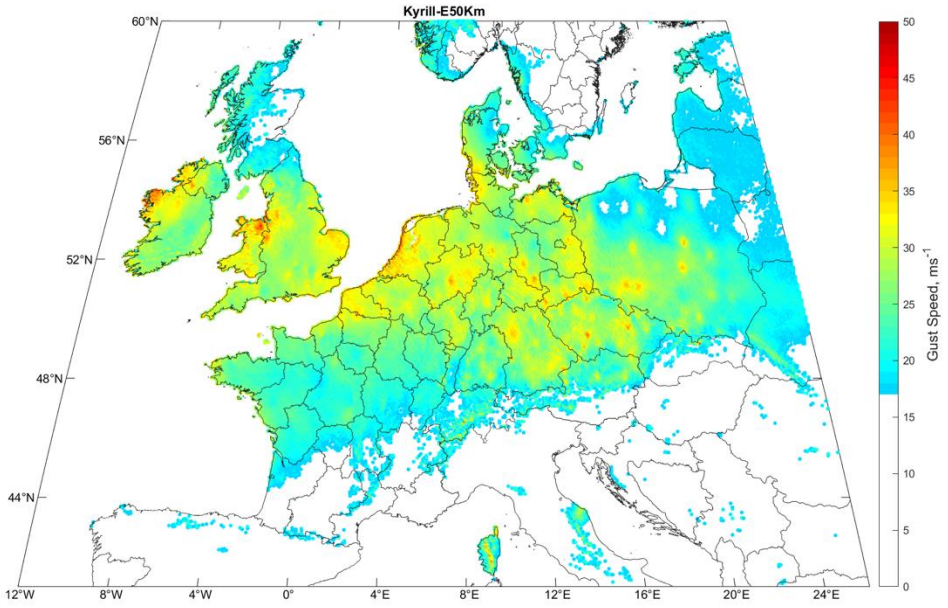


North-to-South shift

100km N | 50km N | **Original** | 50km S | 100km S



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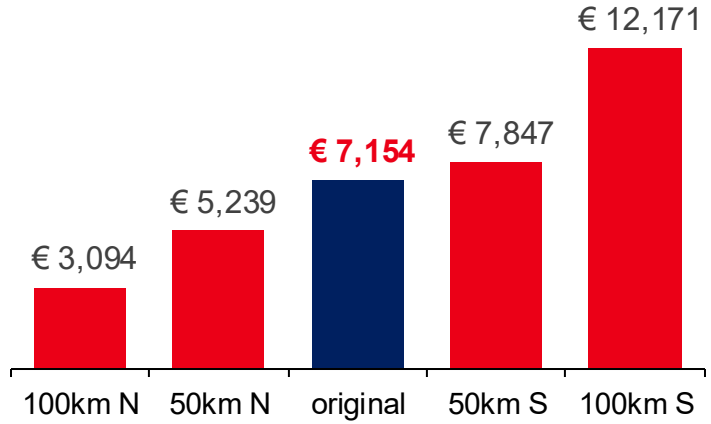

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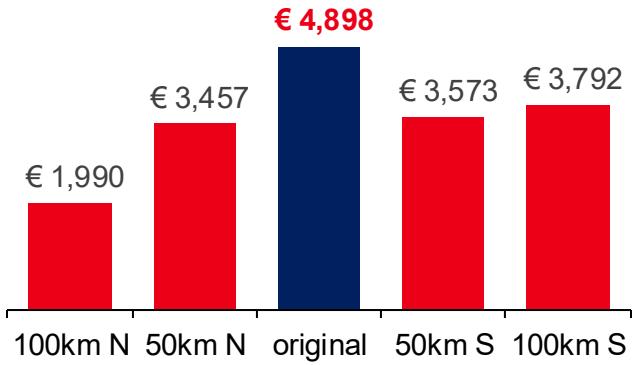

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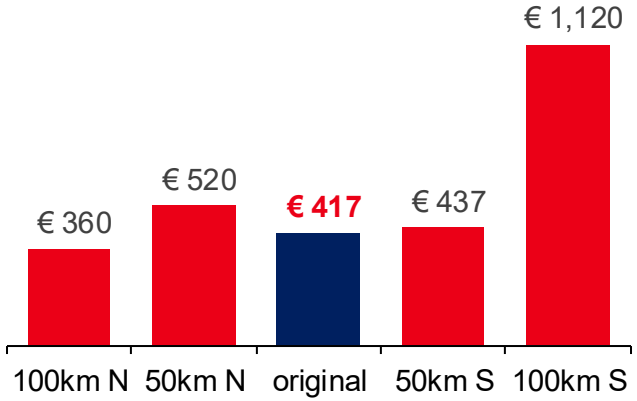
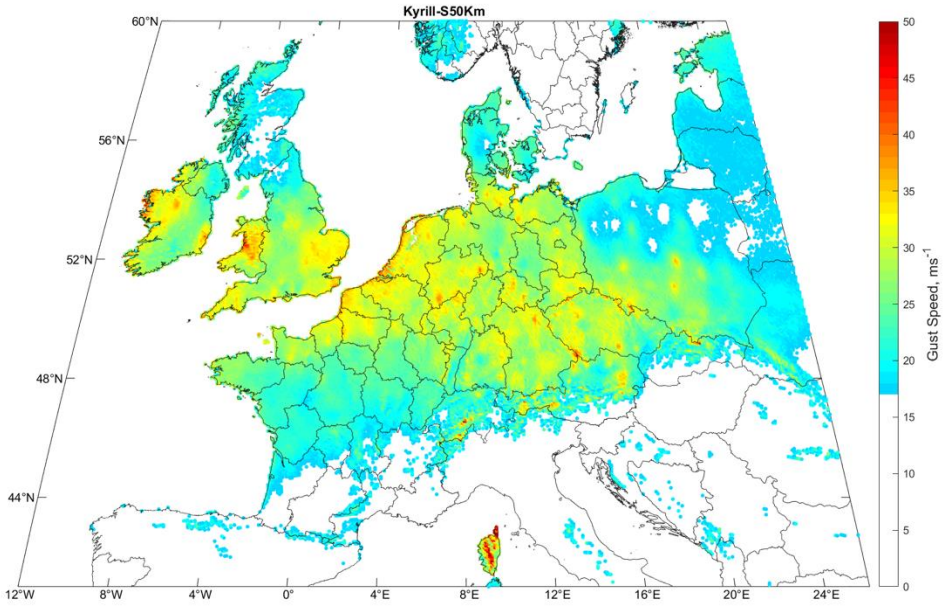


North-to-South shift

100km N | 50km N | Original | **50km S** | 100km S



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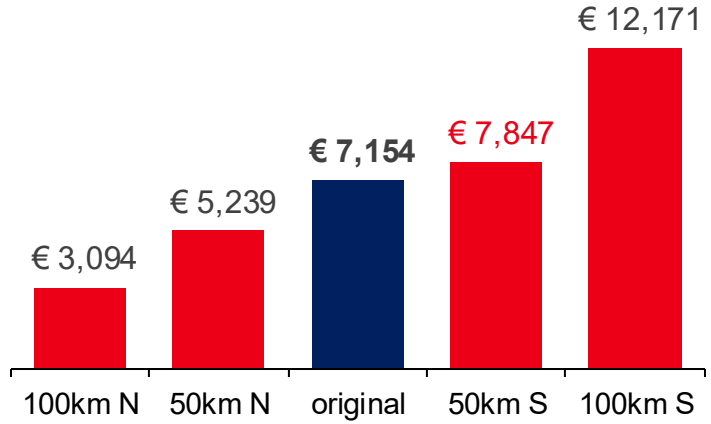

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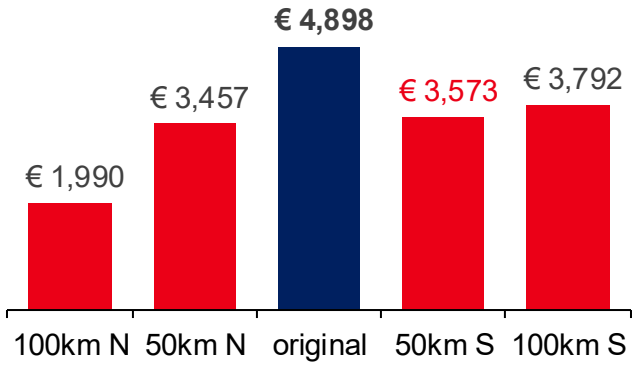

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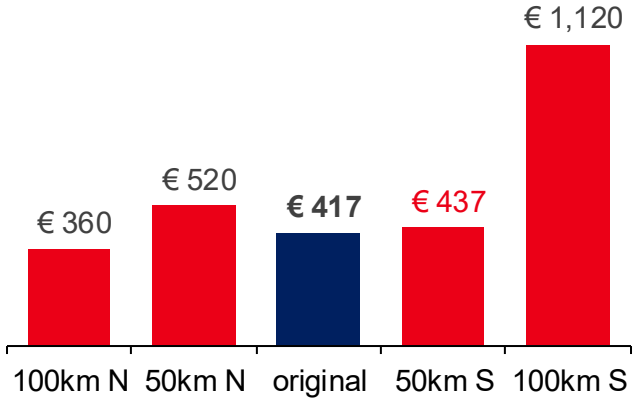
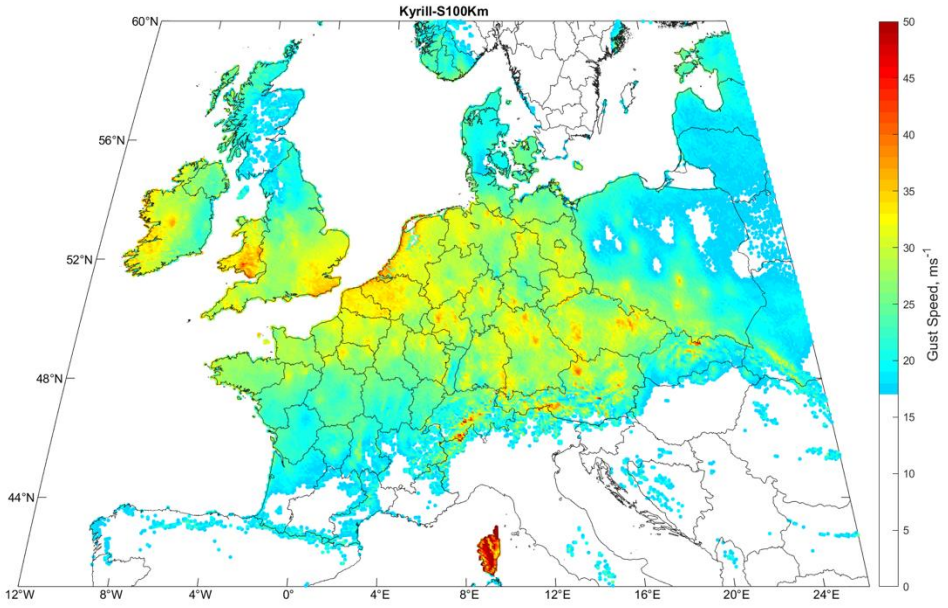


North-to-South shift

100km N — 50km N — Original — 50km S — **100km S**



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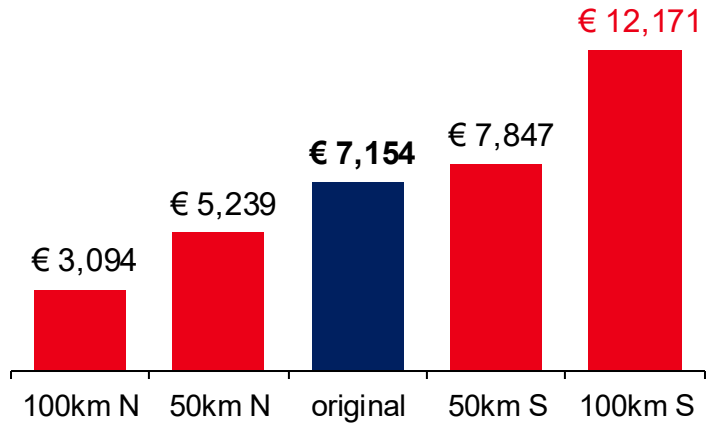

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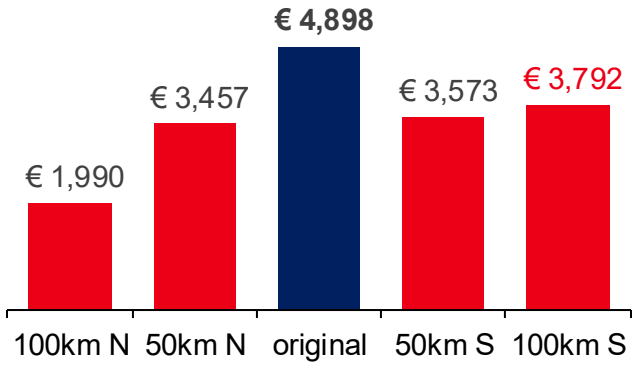

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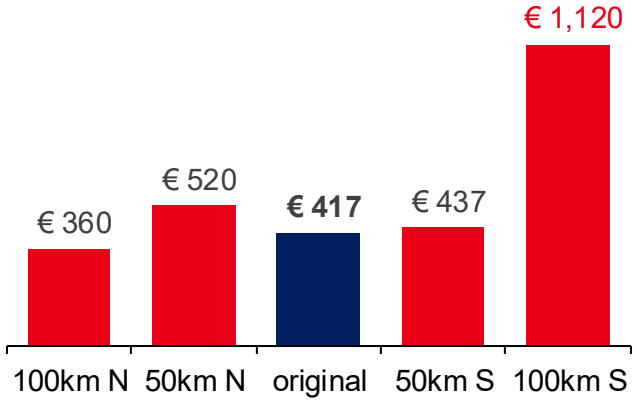
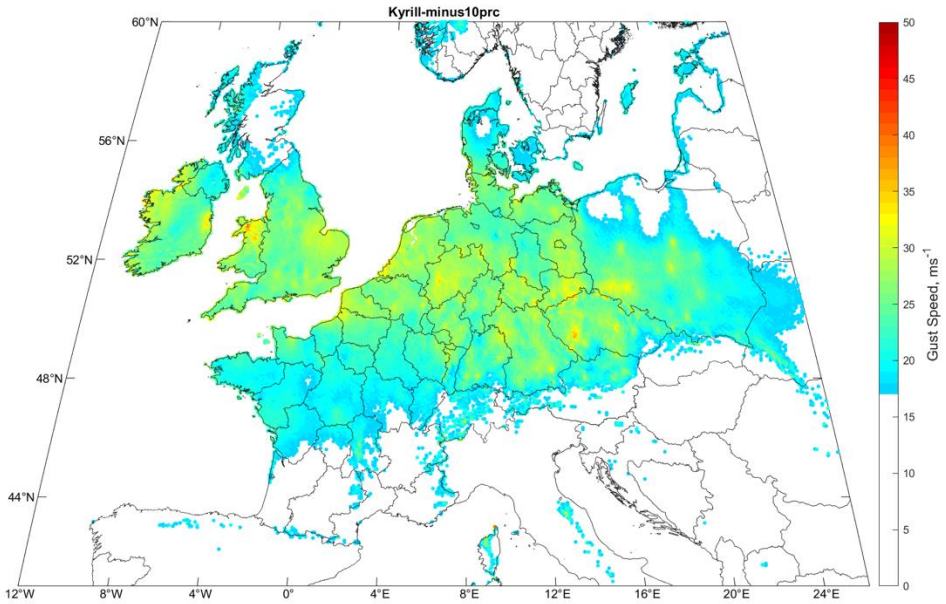
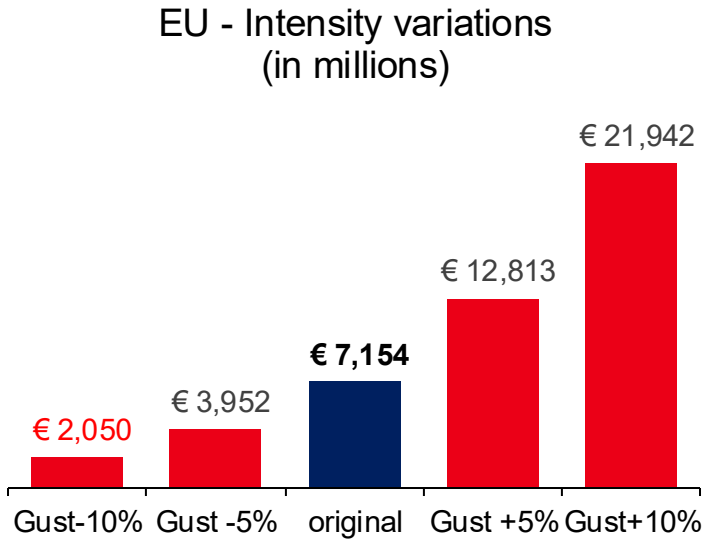


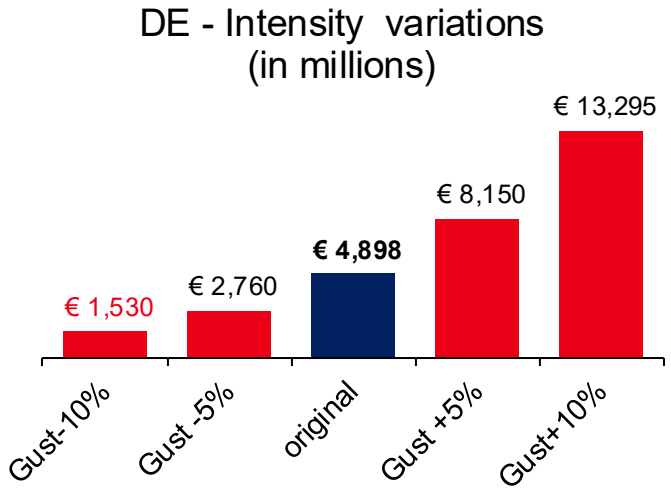
AON

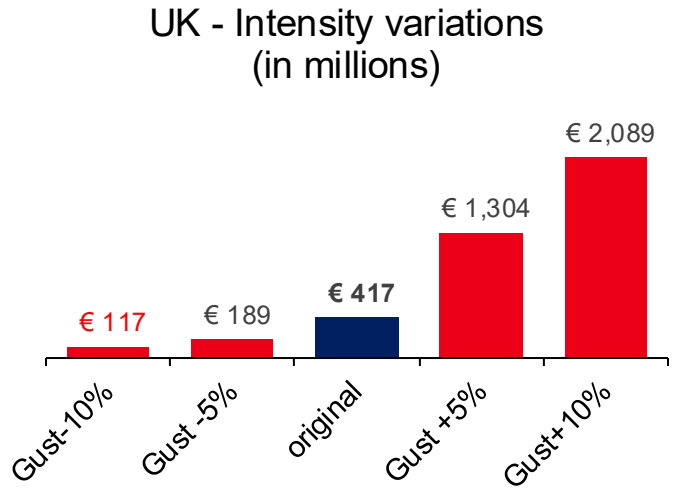
Intensity sensitivity

-10% -5% Original +5% +10%



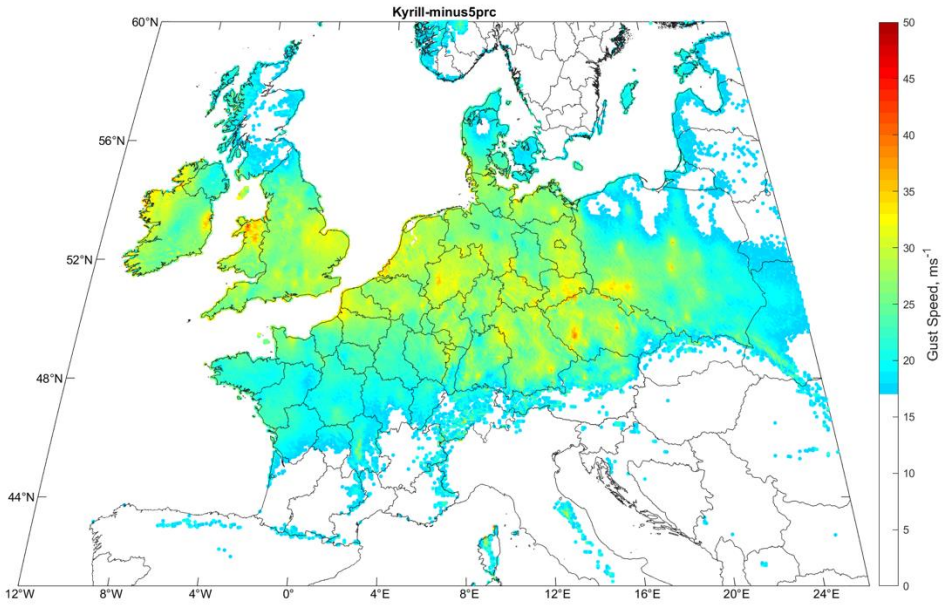




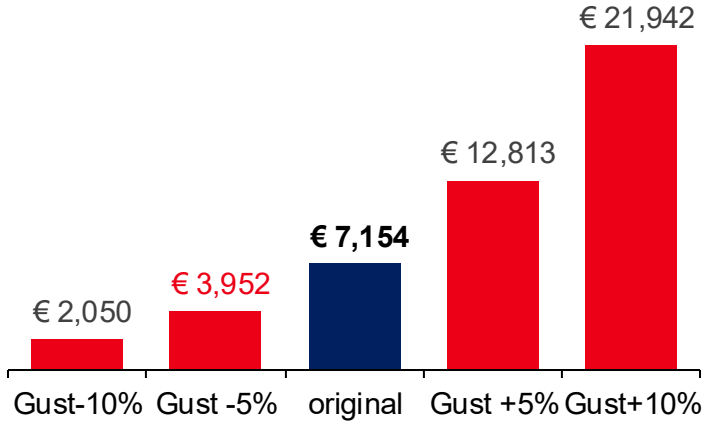


Intensity sensitivity

-10% **-5%** Original +5% +10%



EU - Intensity variations (in millions)



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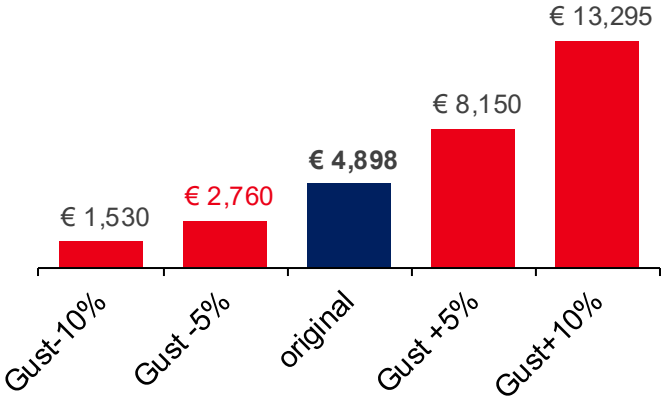
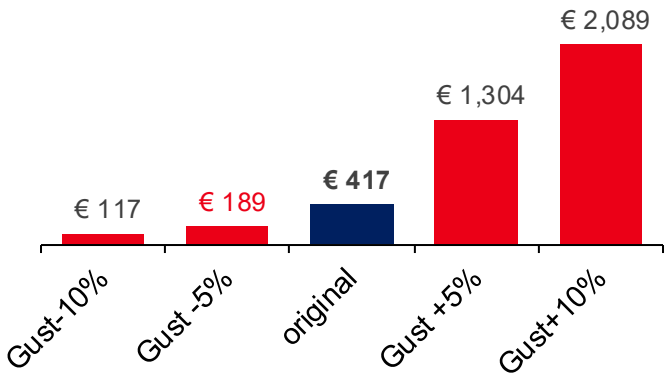
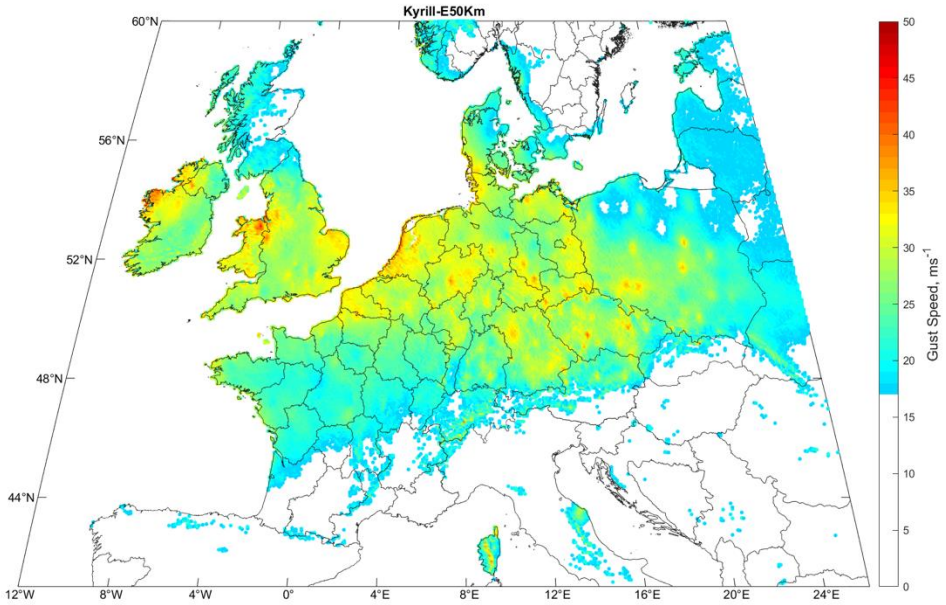


UK - Intensity variations (in millions)

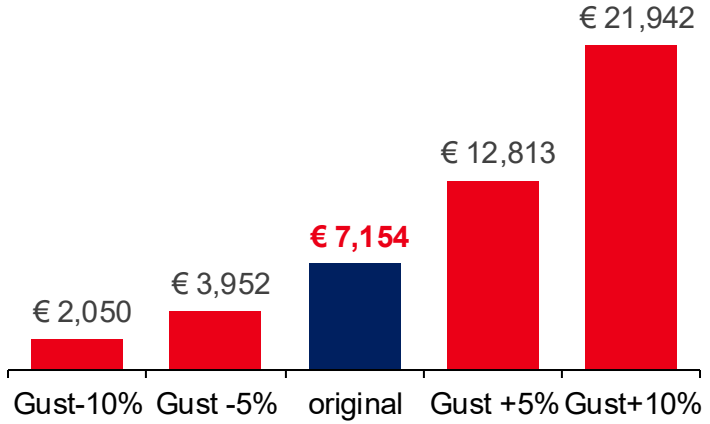


Intensity sensitivity

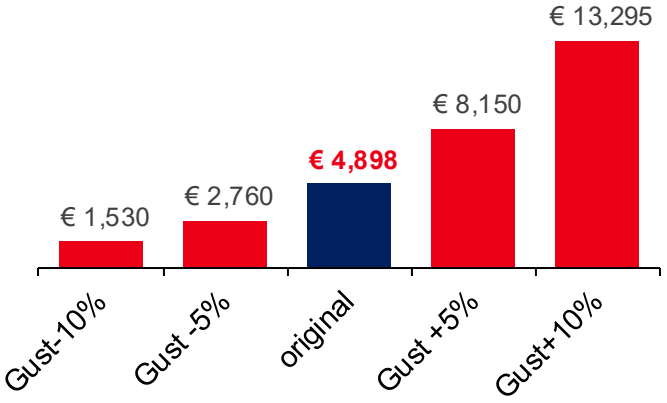
-10% -5% **Original** +5% +10%



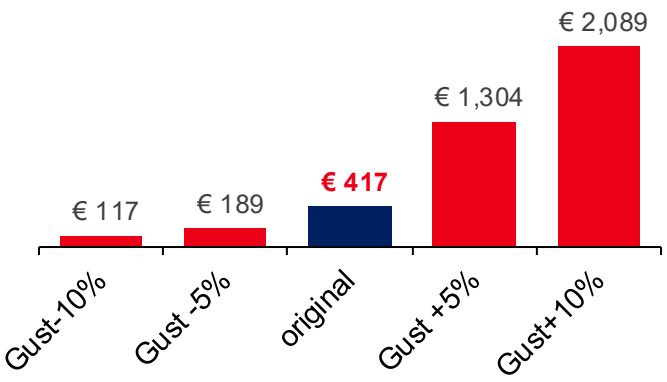
EU - Intensity variations (in millions)



DE - Intensity variations (in millions)



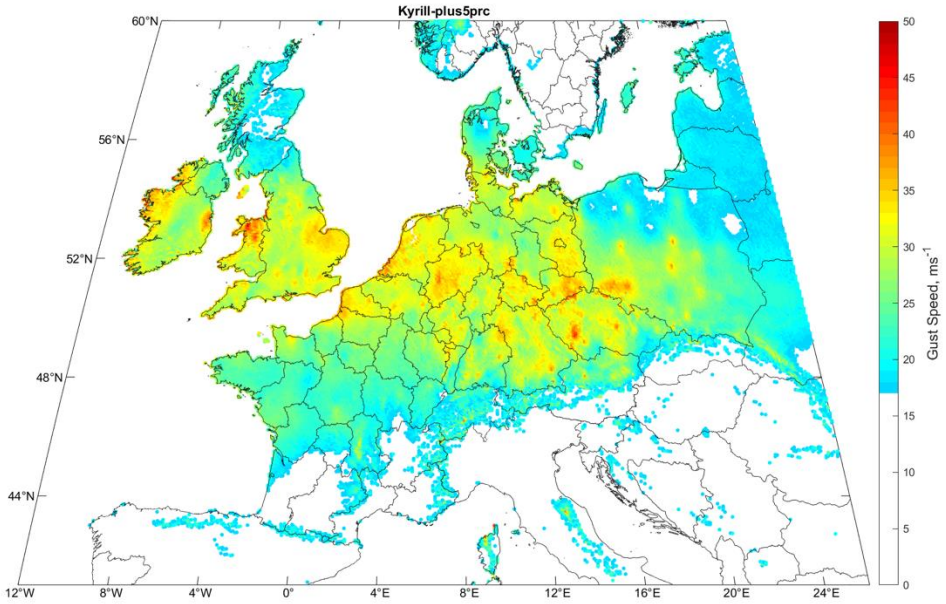
UK - Intensity variations (in millions)



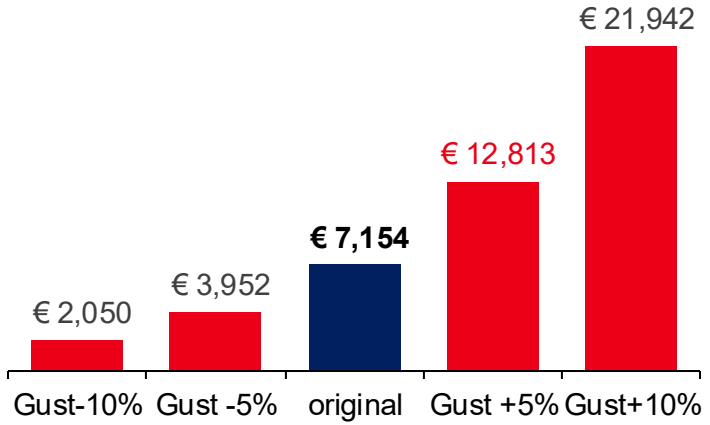
AON

Intensity sensitivity

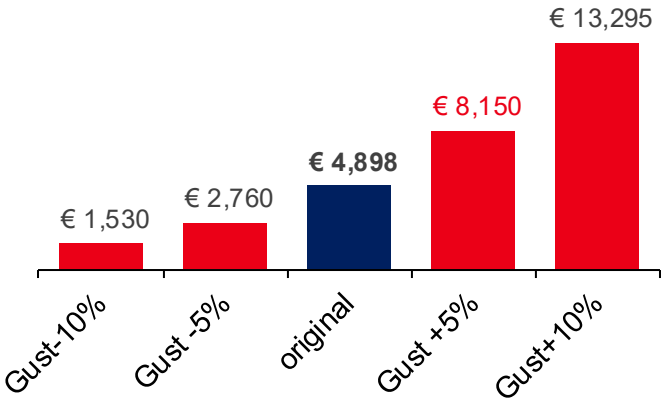
-10% -5% Original **+5%** +10%



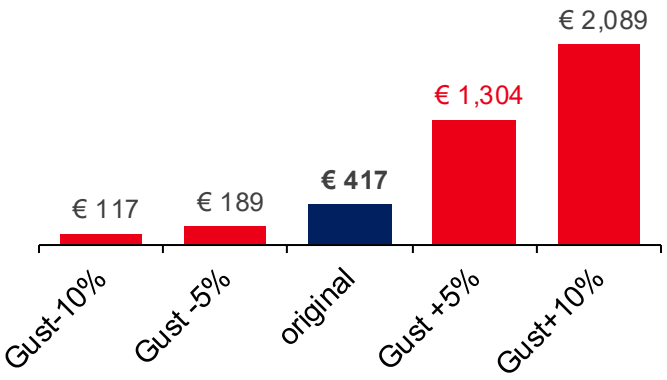
EU - Intensity variations (in millions)



DE - Intensity variations (in millions)

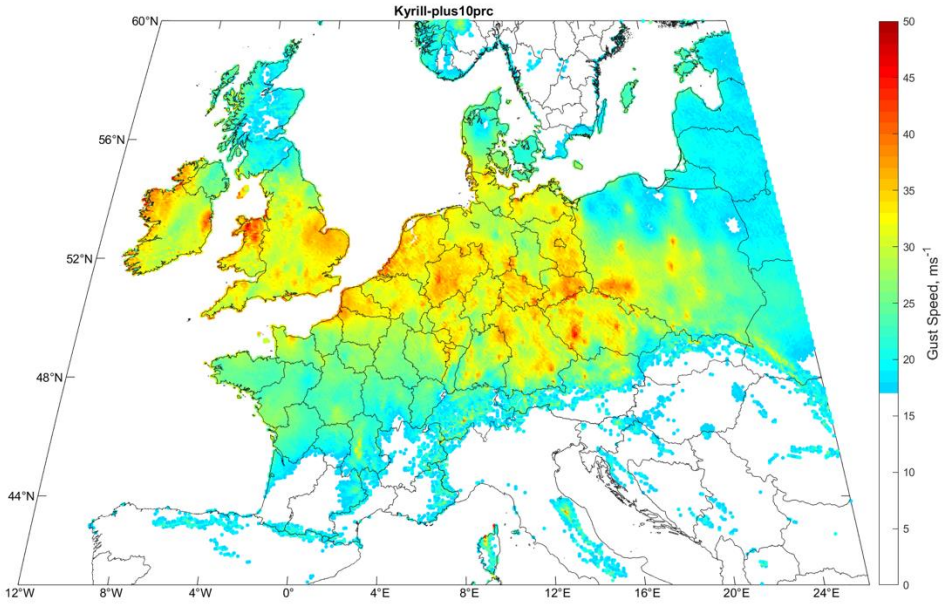


UK - Intensity variations (in millions)

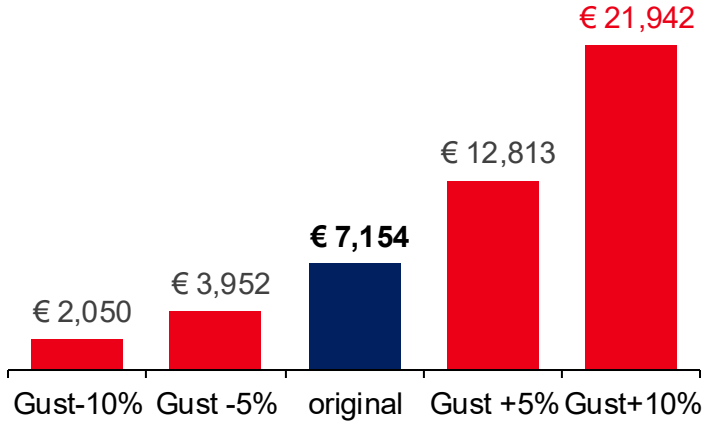


Intensity sensitivity

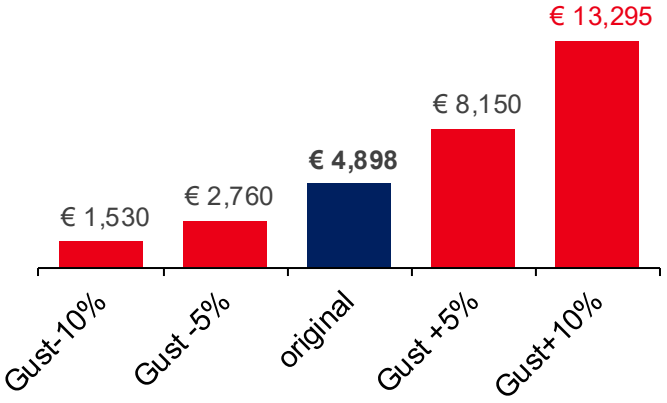
-10% -5% Original +5% **+10%**



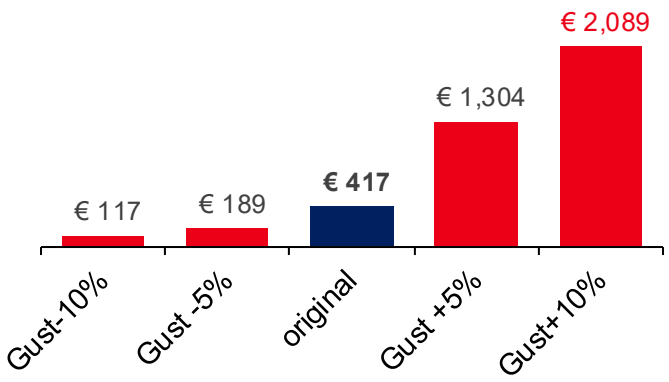
EU - Intensity variations (in millions)



DE - Intensity variations (in millions)



UK - Intensity variations (in millions)

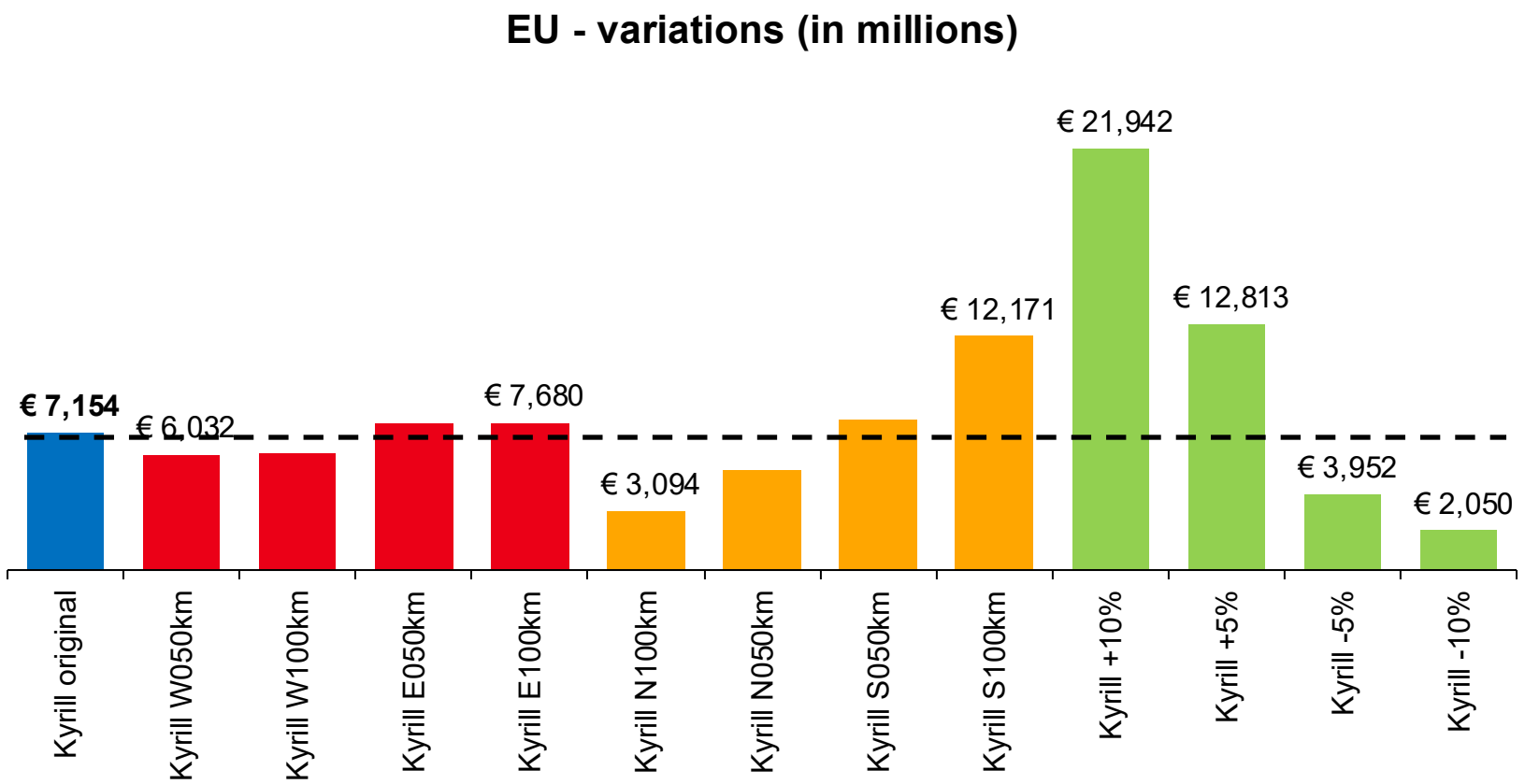


3

Conclusions

Summary & Conclusions
Loss sensitivity

- Loss estimate is very sensitive to hazard change.
- The **gust intensity** is the most sensitive parameter.
  - A 5.0%increase typically doubles the losses.
- The **meridional** repositioning is also impactful. Southward shift increases the losses as the storm extends inlands.
- The **zonal** movement on the other hand is the least sensitive.



Summary & Conclusions

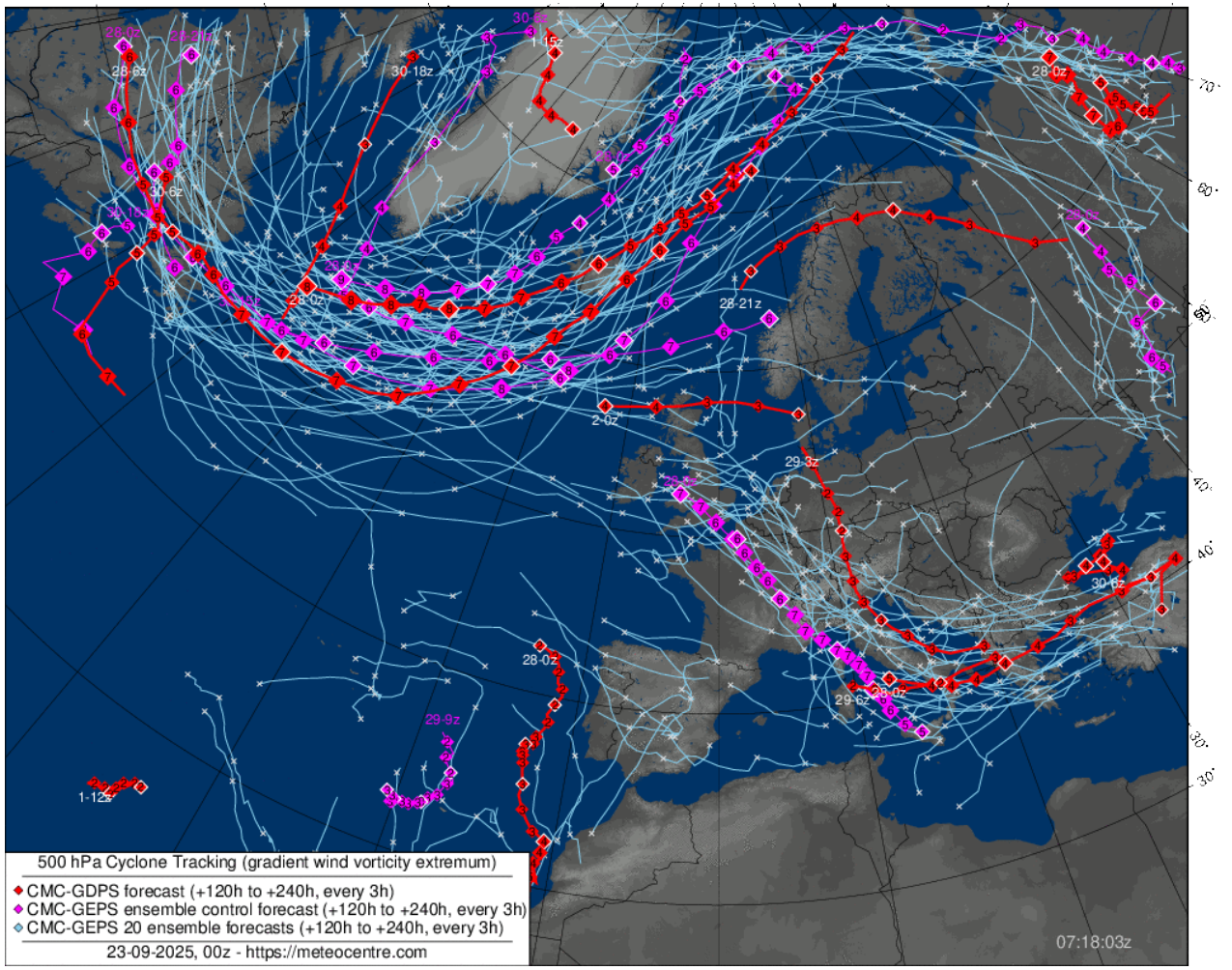
What it is & what it is not?

What it is?

- Quick, loss **sensitivity test.**
- Provides insights about the **uncertainty** in the loss modelling.

And what it is not?

- Simulation of counterfactual events.
- The methodology lacks the physics to answer the question: *what if Kyrill was 100km further in the South.*
  - To do that, you need to use the alternative footprints from the **<u>forecast ensemble</u>** (20-50 members usually).



Thank You

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Head of Weather Risk Modelling EMEA

Impact Forecasting

Key Publications

Georgiadis A.P. and G.R. Bigg (**2007**). 'Environmental links to reduced tropical cyclogenesis over the south-east Caribbean', *International Journal of Climatology* **27**(8): 989-1001. **DOI: 10.1002/joc.1451**

Foote M, K. Mitchell-Wallace, M. Jones, J. Hillier, B. Page, A. Podlaha, C. Souch, R. Gunasekera, S. Latchman, M. Simic, R. Vitolo, N. Shome, A. Georgiadis, P. Puncochar, G. Trendafiloski, C. Ewing, R. Drinka, R. Solnicky, S. Cerna, M. Hill (**2017**). 'Building Catastrophe Models' in 'Natural Catastrophe Risk Management and Modelling: A Practitioner's Guide', *John Wiley & Sons, Ltd*. **DOI: 10.1002/9781118906057.ch4**

Mömken J., I. Alifdini, A.M. Ramos, A. Georgiadis, A. Brocklehurst, L. Braun, and J.G. Pinto (**2024**). 'Insurance loss model vs. meteorological loss index – how comparable are their loss estimates for European windstorms?' *Nat. Hazards Earth Syst. Sci.* **24**, 3445–3460. **DOI: 10.5194/nhess-24-3445-2024**

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