



## Supplement of

## Comparison of source apportionment approaches and analysis of non-linearity in a real case model application

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Figure S1. PM<sub>10</sub> yearly mean concentrations for 2010 obtained with CAMx. The empty markers indicate the sites for which a detailed analysis of interaction terms and gas ratio was carried out.



Figure S2. PM10 yearly mean concentrations for 2010 obtained with FARM



Figure S3. Annual average impacts of RES expressed as proportion of the base case for 20% and 50% ERLs.



Figure S4. Emissions of  $NH_3$  (a),  $NO_x$  (b) and  $SO_2$  (c) in the studied domain in 2010.

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Figure S5. Scatter plots of the BF impacts (CAMx and FARM) on particulate sulfate versus the TS contributions (PSAT) for 20%, 50% and 100% ERLs. Agriculture (AGR), industry (IND) and traffic (TRA).



Figure S6. Scatter plots of the BF impacts (CAMx and FARM) on particulate nitrate versus the TS contributions (PSAT) for 20%, 50% and 100% ERLs. Agriculture (AGR), industry (IND) and traffic (TRA).



Figure S7. Scatter plots of the BF impacts (CAMx and FARM) on particulate ammonium versus the TS contributions (PSAT) for 20%, 50% and 100% ERLs. Agriculture (AGR), industry (IND) and traffic (TRA).



Figure S8 Map of the binary and ternary interaction terms of the  $PM_{10}$  factor decomposition for AGR, IND and TRA in the CAMx 50% scenarios.



Figure S9 Map of the binary and ternary interaction terms of the  $PM_{10}$  factor decomposition for AGR, IND and TRA in the CAMx 20% scenarios.



Figure S10 Map of the binary and ternary interaction terms of the PM<sub>10</sub> factor decomposition for RES, IND and TRA in the FARM 50% scenarios.



Figure S11 Map of the binary and ternary interaction terms of the PM<sub>10</sub> factor decomposition for AGR, IND and TRA in the CAMx 100% scenarios expressed as percentage of the base case (BC).



Figure S12 Map of the binary and ternary interaction terms of the PM<sub>10</sub> factor decomposition for AGR, IND and TRA in the CAMx 50% scenarios expressed as percentage of the base case (BC).