This program serves as on-line appendix for the MSc Thesis entitled “Price-Region Bids: Integrating Flexible Infrastructures in Electricity Markets” (Lucien Bobo, November 2018). It runs on Matlab, and requires the YALMIP optimisation toolbox to be installed: https://yalmip.github.io/.

The main file **main.m** computes the thesis’ case study results. It first generates spot price scenarios, derivatives market bids and clear the derivatives market. It then generates spot price bids for two realisations of wind and load, clears the spot market for each realisation. It uses a set of scripts and functions, whose roles are described in the following,

analyses.m
Display market equilibria and computes year-ahead surplus distributions (used in main.m)

clearing.m
Computes an efficient market equilibrium for a set of price-region bids (used in main.m)

compute_yearahead_flexiblevolume.m
Computes total economic surplus distributions, risk-averse objective and guaranteed minimum surplus with and without accounting for forward contracts traded in derivatives auction (used in analyses.m)

costregion_singlenode_piecewise.m
Formulates a price-region bid for an actor with a piecewise cost function such as the case study’s peaking power plan (used in spot_bids.m)

costregion_singlenode_pricequantities.m
Formulates a price-region bid equivalent to a price-quantity bid (used in spot_bids.m)

costregion_singlenode_proportionalprofile_riskhedging.m
Formulates a bid for risk-hedging forward contracts based on a CVaR risk metric (used in derivatives_bids.m)

derivatives_bids.m
Defines the derivatives market participants’ bids as price-region bids (used in main.m, scenarios.m)

infrastructure_definition_new_DH.m
Defines the district heating utility’s price-region bid (used in derivatives_bid.m)

infrastructure_definition_singlelineTSO.m
Defines the TSO’s feasible region of operation as a price-region bid (used in derivatives_bid.m)

run_multiple_spots.m
Runs multiple spot price realisations for generating spot price scenarios (used in scenarios.m)

scenarios.m
Generates year-ahead spot price scenarios for the risk-averse actors bidding strategies (used in main.m)

spot_bids.m
Defines the spot market participants’ bids as price-region bids (used in main.m, scenarios.m)