



Séminaire Energie Samovar du 26 septembre 2017

Présentation de **Wael LABIDI**, Doctorant à Télécom SudParis

Titre : « Optimal energy management strategies in mobile network powered by a smart grid »

Résumé:

We focus in this work on energy management strategies for mobile network, equipped with battery storage capacity as well as local energy production capability, and powered by a smart grid. On the long-term, the operator has to decide on the optimal dimensioning of its battery and if it has to invest in a DC/AC converter to be able to sell energy back to the grid. On the short-term, with respect to its investment decisions, the mobile network operator has to decide whether to operate its network based on its own energy resources or the smart grid ones, with a possibility to sell energy to the smart grid as well. The operator can be part of demand response feature in which it has to stop consuming from the grid when the latter asks it to at high electricity load.

We formulate our problem using Markov Decision Process (MDP) and derive an optimal policy, which minimizes the telecommunication operator energy bill, using dynamic programming algorithm. We show the optimality of our solution by numerical comparison with the case of being exclusively powered by the grid. Our numerical applications allow to further understand when the operator has an incentive to buy energy, whether it is beneficial for him to act as aggregator (energy seller) as well as the size of the battery to deploy.

Unité Mixte de Recherche : **UMR 5157**

Télécom SudParis - CNRS

9 rue Charles Fourier

91011 Evry Cedex

☎ (+33) 01 60 76 43 02

direction.samovar@telecom-sudparis.eu