NYU Stern School of Business
Department of Information, Operations & Management Sciences
OPERATIONS MANAGEMENT RESEARCH SEMINAR

TOPIC: **Business Models for Off-Grid Energy Access at the Bottom of the Pyramid**
SPEAKER: **Serguei Netessine (INSEAD)**
DATE: **Wednesday, April 6, 2016**
TIME: **11:00 AM-12:00PM**
PLACE: **KMC 3-60**

ABSTRACT

One in every five people in the world does not have access to electricity. This population lives on less than 2 USD daily income and mainly relies on harmful kerosene for their lighting needs. Solar based solutions such as solar home systems and portable solar bulbs require high upfront investment and are often unaffordable for this market due to their tight liquidity constraints. In contrast, there are business models relying on rechargeable light bulbs that are sold at a subsidized price (which makes them affordable) and require regular micropayments for recharges (which helps with liquidity constraints). These bulbs provide a cheaper and healthier light source than kerosene, yet their adoption is lower than expected and some consumers continue to use kerosene. In this paper, we propose a stylized consumer behaviour model to explain this technology preference. In addition to monetary costs incurred while using a light source, our model accounts for the inconvenience cost (due to repeated purchases) and blackout cost (due to liquidity constraints) associated with that source. We find that, although using kerosene costs more money than bulbs, consumers who face high inconvenience (blackout) cost relative to blackout (inconvenience) cost prefer kerosene to bulbs because the quantity flexibility offered by kerosene allows them to purchase in large (small) quantities which helps them save on their long run inconvenience (blackout) cost. At the firm level, increasing bulb capacity increases market level demand for bulbs but reduces revenue-per-consumer due to lower recharge frequency. This trade-off leads to an optimal bulb capacity. We also show that the firm operating rechargeable bulbs could gain consumers from the segments which normally prefer kerosene by offering a more flexible product design, such as allowing partial recharges. Strategies which alleviate liquidity constraints (such as price discounts, mobile micropayments) may not always lead to better adoption because they result in higher consumption rate in the long run which in turn leads to higher inconvenience. However, when they are combined with inconvenience reducing strategies, together they are likely to improve the usage of bulbs.

BIO

Serguei Netessine is the Timken Chaired Professor of Global Technology and Innovation at INSEAD and the Research Director of the INSEAD-Wharton alliance. Prior to joining INSEAD in 2010, he has been a faculty member at the Wharton School, University of Pennsylvania, which he joined in 2001.

Prof. Netessine received BS/MS degrees in Computer Science and Electrical Engineering from Moscow Institute of Electronic Technology and, after working for Motorola and Lucent Technologies, he also received MS/Ph.D. degrees in Operations Management from the University of Rochester. His current research focuses on business model innovation and operational excellence and he worked on these topics with numerous organizations including Federal Aviation Administration (USA), Lockheed Martin, Procter & Gamble, McDonald's, Rolls Royce, Comcast, Expedia, ABB and US Air Force. Additionally, he serves on advisory boards of multiple startup companies. Professor Netessine is a frequent speaker on innovation at industry events including World Knowledge Forum (Seoul) and World Economic Forum (Davos). His work has received extensive media coverage in CIO Magazine, the Economist, Forbes, Multichannel Merchant, New York Times, US News and Strategy & Business and other media outlets. He is the co-author of "The Risk-Driven Business Model: Four Questions that Will Define Your Company" (Harvard Business Press, 2014) and he regularly blogs about innovation on http://www.defineyourcompany.com. Follow him on Twitter @snetesin.