



# Introducing TLG DART

## TLG's Deep Analytics Resources and Tools (DART) Initiative

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### Energy and Data Have Been Together for a Long Time

They started dating early, better to focus on the fundamentals of their relationship. They quickly mastered the joys of least cost dispatch, merit orders, system alphas, marginal costs, nodal pricing, energy and reserves market co-optimisation, market trading, competition dynamics, bidding strategies, and constraint management or constraint-pricing arbitrage.

More recently, though, they face new challenges. The role of data and advanced analytics in the energy world has expanded multi-fold to support (1) efficient and reliable integration of variable renewable energy resources; (2) optimisation of energy storage; and (3) smarter applications of time-of-use pricing, demand response, and prices-to-devices concepts. Beyond these, there remains the further challenge of mastering complex, multi-product energy / industrial / transportation systems. Energy and data have always been close. They are now almost inseparable. Indeed, the only thing that should get between energy and data is a good model.

The Deep Analytics Resources and Tools (DART) initiative at TLG is all about the specialist nature of solutions to complex energy challenges. The importance of advanced analytics to our success to date and any success we might hope to have in the future cannot be over-stressed. DART@TLG supports our client and internal initiatives requiring advanced analytical capabilities, mastery of big data sets, application of machine learning techniques, development of specialised forecasting tools, as well as the evolution and application of our powerful QUAFU market simulation modelling framework.

We utilise simulation frameworks for almost every market in the Asia Pacific region using our constantly evolving QUAFU modelling tools. As problems become more complex and granular, we add new capabilities to our growing tool kit. We also partner with our long-term clients on deep analytics issues, provide deep integration support, tools, and strategic advisory.

### Meet the Team

[Paul Buckland](#) heads up the DART initiative at TLG, which manages TLG's QUAFU modelling platform, creating powerful decision-support tools to enhance our capabilities to assist our transaction-focused clients. Paul has nearly two decades of modelling experience in the energy industry, employing both deterministic and stochastic optimisation techniques, neural networks, and time series analysis in his approach to answering client requests. Paul excels in crafting specialised tools for end-users to enable analysis and produce useful insight. He builds the methodologies and mathematics behind these tools, along with their design and creation from a software engineering perspective. Paul holds a BA(Hons) and MSc in Mathematics from Otago University, New Zealand. He is fluent in English and competent in Japanese.

## DART@TLG Covers:

- Broad market simulation models for transactions, planning, and strategy development across increasingly complex and numerous value streams;
- Narrow, specialised models of the value of idiosyncratic performance characteristics (storage, ramping);
- Demand forecasting using deep analytics of emerging trends;
- Managing, cleaning, and analysing massive amounts of AMI data for developing smarter pricing strategies;
- Systematic commodity market analysis of price spreads and levels incorporating consistent combinations of forward data and expert views;
- Bidding behaviour and market power mitigation;
- Interactive models that provide more intuitive technology cost and performance assessments;
- Voting, ranking, and choice analytics for multi-attribute tender evaluation;
- Determination of capacity contribution value ('relevant level') in capacity resource markets;
- Structured data analysis and development of market models for each major Asia Pacific market;
- Data and analytics support to TLG's publications and subscriptions services; and
- Bespoke modelling and analytics for complex / hybrid energy+ applications.

[Dr Ashim Basnet](#), Manager, Hong Kong. Ashim has extensive modelling and analytical skills acquired from his studies in engineering and mathematics, and has experience building complex optimised solutions that provide insight into market and policy problems. Ashim holds a BEng from Tribhuvan University, Nepal, and an MSc (Engineering) and PhD (Engineering) from the University of Hong Kong.

[Ashish Chopra](#), Consultant, India. His experience lies in the energy sector combined with mathematical optimisation, statistical modelling and predictive analytics. Ashish has been part of multiple quantitative and qualitative studies relating to impact assessment for various government policies in India and has engaged extensively with a wide variety of power sector stakeholders in the energy sector in India. Ashish holds a Bachelor and Master of Technology in Geophysical Technology from the Indian Institute of Technology in Roorkee, India.

[Ashutosh Pande](#), Consultant, India. Ashutosh's field of expertise is optimisation and analytics within the energy sector. He has worked on several projects in linear programming and mixed integer programming that have included detailed modelling and analysis for generation and transmission capacity expansion planning, solving unit commitment problems, portfolio optimization, including modelling of ancillary services, energy storage systems, and demand response, and estimating opportunity values of various assets and policies. Ashutosh holds a BTech in Industrial and Production Engineering from the Indian Institute of Technology, Delhi and an ME in Industrial and Systems Engineering from North Carolina State University, USA.

[David Broadstock](#), Non-Executive Director, Singapore. David brings to TLG a reputable background in analytics, and applied econometric modelling of energy related issues, with an emphasis on topics in consumer behaviour and energy finance. David's experiences have spanned international consulting, working with NGO's and international institutions, and with the academic sector, as both a researcher and educator. David started his professional career in the UK, but has spent over a decade in Asia, working in Chengdu, Hong Kong, and now Singapore. In addition to supporting TLG, David currently serves as a Vice President for the International Association for Energy Economics (IAEE), and Editor of The Energy Journal, one of the leading academic journals dedicated to the economics of energy markets/systems. David holds a PhD, Economics, University of Surrey, UK and a BA(Hons) and MSc, Business Economics, University of Portsmouth, UK

[Prof Grant Read](#), Senior Advisor, New Zealand. Grant has been closely involved with the electricity sector for 40 years, both as a researcher and a consultant on economic optimisation, reservoir management, pricing, modelling, and market design. He played a key role in developing New Zealand's pioneering co-optimised energy/reserve market, and subsequently in Australia, Singapore, and elsewhere. More recently, his research has extended into gas, water, and environmental markets. Grant holds a BSc (1st Class Honours) in Mathematics, and a PhD in Operations Research from the University of Canterbury, New Zealand. For many years he lead the Energy Modelling Research Group, at Canterbury University, in New Zealand, where he is currently an Adjunct Professor to the Electric Power Engineering Centre.

For more information about our team and how it can help you, please email us on [projects@lantaugroup.com](mailto:projects@lantaugroup.com).