

DAN HARRIS

Principal

Rome | London

+39.06.48.88.810 | +44 20 3829 2346

dan.harris@brattle.com

Mr. Dan Harris has nearly twenty years of experience as an expert in valuation and quantification of damages. He has been retained by major law firms and their clients to testify on damages and quantum in international arbitration proceedings in a variety of forums, including the International Centre for Settlement of Investment Disputes, the International Chamber of Commerce, and the Permanent Court of Arbitration. Mr. Harris has particular expertise in the energy industry and regularly acts as an expert in disputes involving natural gas and LNG in long-term contracts both in Europe and Asia. He has also testified in disputes concerning energy infrastructure, including petroleum distribution assets, power stations, and LNG import terminals. Mr. Harris is listed as one of the world's leading arbitration experts in *Who's Who Legal's* Arbitration Expert Witnesses.

Mr. Harris has consulted on developing tariffs and access arrangements for gas and electricity networks and has authored reports on the cost of capital for gas, electricity, water distribution, and telecommunications networks. He is a co-author of a major textbook on the cost of capital in regulated industries.

Mr. Harris is a regular speaker at gas and electricity conferences, and he lectures at the Florence School of Regulation. Prior to joining The Brattle Group in 2002, Mr. Harris worked for Shell's upstream oil and gas business in the Netherlands for five years in a variety of roles, including the development of economic models for new oil and gas field developments.

EDUCATION

2001-02	London School of Economics London, United Kingdom- MSc. Economics (Merit)
1991-95	Imperial College London, United Kingdom - M. Eng. Chemical Engineering (First Class Honours)

AREAS OF EXPERTISE

- International Arbitration
- Utility Regulatory Policy & Ratemaking
- Natural Gas
- Electric Power

SELECTED EXPERIENCE

Arbitrations and Disputes

- Mr. Harris is acting as an expert for a CIS State-owned oil and gas company in a commercial dispute before the SCC. The work involves quantifying damages to an oil and gas joint venture resulting from the alleged failure of one of the parties to invest the promised funds.
- Mr. Harris acted as an expert witness for Nigeria in an ICSID dispute involving the value of an alleged expropriation in the oil sector. The work involved valuing oil and gas assets and assessing the reasonableness of costs and forecasts, as well as opining on the appropriate damages methodology.
- Mr. Harris is acting as a quantum expert advising in an Energy Charter Treaty dispute between an investor in energy distribution networks in an Eastern European EU Member State and the Government. The work involves an assessment of damages as a result of the measures taken by the regulator, including a valuation of the regulated gas distribution business.
- In the context of an ICSID dispute, Mr. Harris is acting as a quantum expert for a construction company claiming damages against a Middle Eastern country for the alleged early termination of a long-term oil-field services contract. The work involved estimating the value of the contract at termination as well as financial damages resulting from various alleged actions by the State.
- In the context of an ICC dispute, Mr. Harris analyzed a financial model of an LNG liquefaction facility, prepared a report critiquing the assumptions in then model, and analysed the consequences of alternative assumptions for liquefaction tariffs.
- Mr. Harris acted as an expert witness for a buyer of gas in south-east Europe in arbitration before the ICC with its seller. Mr. Harris authored expert testimony on the damages arising from a failure of the seller to supply LNG to the buyer, and gave oral testimony regarding his reports.
- Mr. Harris acted as an expert witness in an ICC dispute involving a large power and water production plant in the Middle East. The work involves testimony on the financial effects of various delays which the project experienced, as well as addressing a claim by the offtaker that the plant's tariff should be reduced because of alleged non-conformity with the contract specifications.
- Mr. Harris co-authored a report which estimated damages to the developer of a cancelled power station project in Turkey, and re-rebutted claims of damages from the developer's expert (ICSID arbitration).
- Mr. Harris acted as an expert witness in a dispute regarding the supply of gas produced from the North Sea in Europe. Mr. Harris was been retained to give evidence on the value of unusual delivery terms in the contract, relative to a more standard contract.

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- In the context of an appeal of the proposed regulated gas tariffs in South Africa, a group of large gas users commissioned Mr. Harris to write a report critiquing the methodology that the regulator had proposed to set gas prices. The work analysed the economic logic of the regulator's proposed method, addressed supporting arguments from the regulator's economic experts, explained the history of gas pricing in Europe and how it had developed, and contrasted the regulator's method with the regulatory methodologies of other regulators. The report was submitted to the South African High Court.
- Mr. Harris acted as a quantum expert in an investor-State dispute in south-east Europe, relating to an investment in the petroleum sector.
- Mr. Harris acted as an expert in an investor-State dispute in south-east Europe, relating to dispute involving the processing of copper concentrate and repayment of loans. The work involved the valuation of a copper mine at various points in time and an assessment of the mine's ability to re-pay debts.
- Mr. Harris is advising a gas buyer in South-East Europe on the value of LNG in a price review under its long-term contract with the gas seller. The work involves analysis of changes in energy prices since the last price review was undertaken.
- Mr. Harris acted as an expert witness for a buyer of gas in south-east Europe in arbitration before the ICC with its seller. Mr. Harris authored expert testimony on a revised price formula.
- Mr. Harris authored expert witness testimony for a seller of gas in Spain in an arbitration process with the gas buyer. The work involves an analysis of end user prices and margins during the relevant periods, as well as advice on the structure of the revised price formula.
- Mr. Harris has authored testimony in a dispute before the Irish High Court between an LNG terminal developer in Ireland and the Irish regulator, regarding the proposed tariffs for the Irish natural gas transport system.
- Mr. Harris advised a large international gas marketer who is selling gas to a buyer in Spain. The work involved assessing the value of gas in Spain during the relevant periods.
- Mr. Harris advised a buyer of gas in Italy in re-negotiating its gas price with a larger international gas seller. The work involves reviewing the buyer's claims for consistency with the economic principals of the gas contract.
- For a buyer of gas in France and in the context of an arbitration, Mr. Harris has assisted in the preparation of a report detailing the relevant changes in the French market that justify a revision of the gas contract price. Mr. Harris also developed detailed alternative formulae for the new gas price that better reflect the value of gas. The work is in anticipation of arbitration.
- Mr. Harris advised an Italian-based purchaser of gas in a series of negotiations and arbitrations with their gas suppliers involving multiple gas supply contracts in an SCC arbitration.
- As part of an ICC contract arbitration proceeding, Mr. Harris co-authored expert witness testimony on the development of Gas to Gas Competition (GTGC) in the Italian gas market. The

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testimony explained how competition at the retail level could affect the value of imported gas, and examined quantitative evidence of the existence of GTGC.

- In the re-negotiation of a LNG supply agreement, Mr. Harris managed the estimation of the value of gas based on the best alternative fuel in a number of different market segments. Mr. Harris also critiqued the analysis of the counter-party, and highlighted areas where the other side had made numerical or conceptual errors in estimating the value of gas.
- In the context of an ICSID arbitration, Mr. Harris undertook an analysis of the market for Compressed Natural Gas in Argentina, and estimated the effect of price controls on demand for CNG.

Cost of Capital

- Mr. Harris was chosen by the European Commission from 17 other potential candidate firms to develop a common EU methodology for estimating the cost of capital in the European telecoms sector. The work highlighted areas where Brattle considered it would be appropriate to set single EU-wide values for WACC parameters, and recommended common EU-wide methodologies to estimate parameter values specific to a Member State. The report also assesses the reasonable return on investments for 'legacy' copper networks and Next Generation Access (NGA) networks. The European Commission subsequently published the report.
- Mr. Harris co-authored a report for a European airport operator, estimating its cost of capital in the context of a regulatory proceeding, and in particular advising on adjustments to the airport's 'beta' to account for the operator's specific circumstances.
- Mr. Harris co-authored a report for a large EU Telecoms operator in the context of a judicial appeal of a tariff decision on the price for fixed line services. The report addressed methodological errors that the regulator had made with respect to the cost of debt, the calculation of beta and the risk-free rate. The report was submitted to the court as part of the appeal process.
- Mr. Harris has undertaken several studies on the cost of capital for NMa and OPTA (now the ACM). The work includes estimating the weighted average cost of capital (WACC) for energy networks, water distribution, pilotage, postal services and various types of telecoms activities. Mr. Harris also advised on the ACM's harmonised methodology for calculating the WACC.
- Mr. Harris led a study for a Member State TSO on its cost of capital. The study responded to specific proposals by the regulator on the various elements of the WACC, and included a survey of other regulators in the EU set the WACC parameters. The report was submitted to the firm's energy regulator.
- For the Italian energy regulator, Mr. Harris presented a study on alternative ways of estimating the cost of capital as part of a two-day seminar on gas transmission tariffs. Mr. Harris discussed different issues and ideas based on international experience. The purpose of the seminar was to guide the regulator in its decisions in its consultation on gas transmission tariffs.

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- For the Greek TSO DESFA, Mr. Harris managed a study to develop the Greek gas tariff regulation and methodology. The work included a methodology for measuring the regulatory asset base, for calculating depreciation, for financing new capital expenditures, for measuring the cost of capital, and for deriving different prices in different locations of the natural gas network. The report was submitted to the Greek energy regulator, RAE, in support of DESFA's proposed tariff regulation.
- Mr. Harris was a key member of a team which provided assistance on the weighted average cost of capital (WACC) for Fluxys. The regulator had just published guidelines describing how the WACC should be calculated. Mr. Harris reviewed these guidelines on behalf of the client, and presented concerns with the regulator's methodology. The study also provided independent estimates of the WACC and reviewed WACC decisions of other regulators elsewhere. Mr. Harris has carried out several other similar analyses of regulatory decisions for regulated network firms.
- Mr. Harris has estimated the cost of capital in the context of arbitrations, where the WACC was used as a discount rate in a financial model to estimate damages.

Competition and State Aid

- Mr. Harris managed a project to analyze whether the investment of an airport operator in a ground-handling company was consistent with the behavior of a rational private investor, or whether it constituted State aid. The analysis looked at the expected profitability of the investment and described the underlying economic logic of the investment based on the specific regulation and legal context of the industries involved.
- Mr. Harris undertook analysis to determine if the terms of a project between Telecom Italia and one of the Italian regions constituted illegal State Aid. Mr. Harris co-authored a report which was submitted to the European Commission.
- For the Dutch competition authority (NMa), Mr. Harris undertook a study to define the relevant geographic market for Dutch electricity generation mergers. The study involved detailed electricity market modelling, and analysis to assess the competitive effects of a series of hypothetical mergers involving Dutch generators. The study was published as the basis of a consultation exercise.
- For the Dutch competition authority (NMa), Mr. Harris led a study to determine whether the largest player in the flexibility market had a dominant position. The work included defining the relevant product markets, estimating market shares and calculating if the largest player had the incentive and ability to exercise market power. The NMa subsequently published the study.
- Mr. Harris has analyzed the competitive effects of proposed energy mergers including Gas Natural/Endesa, Gas Natural/Union Fenosa and E.ON/MOL.
- Mr. Harris co-authored a study for Ofgem on the main barriers to competition in the EU gas market.

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- For the Dutch energy regulator (DTe), Mr. Harris has authored a study on the effectiveness of pipe-to-pipe competition in the Netherlands.
- Mr. Harris undertook analysis in connection with a request for an exemption from Third party Access (TPA) for an LNG terminal planned in Italy. The work involved an assessment of the effect of the proposed terminals on competition in the relevant gas markets within Italy and the terminal's effect on security of supply. In separate engagements and for different clients, Mr. Harris undertook similar TPA exemption analyses for developers of LNG terminals in the Republic of Ireland, the Netherlands and Spain. Mr. Harris also provided advice on the use-it-or-lose-it mechanism, and is currently advising on an open season process.

Market design, tariffs and investments

- Mr. Harris advised the Colombian energy regulator on the indexation of their natural gas contracts, and in particular how to avoid price shocks while keeping prices aligned with market conditions. The work drew on experience of the indexation of gas contracts in other parts of the world.
- In the context of enhancing commodity trading at the Wallumbilla hub, Mr. Harris led a study for the Australian Energy Market Operator (AEMO) on the experiences with international pipeline capacity trading, and measures that have been taken to make unused capacity available for trading. The study drew on experiences in the US and EU markets, and described the relationship between capacity and commodity trading, trading platforms and mechanisms and the contractual arrangements in place, the role of the pipeline owner and operator in capacity trading, use-it-or-lose-it mechanisms in operation the EU and the US. The study also summarised the key ingredients for successful capacity trading, and the steps that the relevant authorities in Australia could take to facilitate capacity trading. AEMO subsequently published our study and we presented the findings to the Australian gas industry.
- For an energy regulator in South America, Mr. Harris was commissioned to develop and present a training program on the use of entry-exit gas transport tariffs. The workshop discussed the advantages and disadvantages of entry-exit tariffs relative to other gas transport tariff methodologies and alternative ways to implement entry-exit tariffs. As part of the program, Mr. Harris also developed an entry-exit tariff model for the gas system of the country, and discussed the relevant results.
- For the Agency for the Co-operation of Energy Regulators (ACER), Mr. Harris led the preparation of an Impact Assessment for the Framework Guidelines for harmonized gas tariffs. The work involved identifying potential problems at the EU level with a lack of gas transport tariff harmonisation, and assessing the suitability of alternative tariff policy options. ACER published Brattle's impact assessment as part of the consultation on the Framework Guidelines. The work was a key element in the development of a harmonised EU gas transport tariff policy.
- For Ofgem, acting as the representative of ACER, Mr. Harris led an assessment of whether the Draft Network Code on gas balancing, prepared by the European Network of transmission

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System Operators for Gas (ENTSO-G), was compliant with ACER's Framework Guidelines on gas balancing. The work both assessed compliance and suggested areas where the draft network code, which will apply across the EU, could be improved.

- For the Dutch Competition authority (the NMa), Mr. Harris undertook research on the feasibility and design of an implicit allocation mechanism for cross-border gas capacity. The work involved assessing the costs and benefits of implicit allocation, as well as assessing whether existing proposals on capacity allocation would negate the need for implicit allocation.
- At the request of the Dutch energy regulator, Mr. Harris led a study to determine the financial implications for the Dutch transmission operator if its Regulated Asset Base was reduced without further equity injections. Specifically, the study looked at the ability of the operator to maintain its future investment plans without incurring an excessive level of debt.
- For Ofgem, Mr. Harris conducted a study on the feasibility and desirability of a separate market for selling power from intermittent renewable energy in the UK - a so-called Centralized Renewables Market. The study considered the particular issues facing intermittent renewables operating in the GB market, including difficulty in predicting output day-ahead and subsequent exposure to balancing penalties. The study did not recommend the creation of a separate CRM market, but made several other recommendations including greater use of aggregation to reduce imbalance risks.
- For the TSO of Belgium, Mr. Harris reviewed the consistency of the gas tariff methodology with the economic principals of the gas Directive and the gas Regulation 715/2009. This was in the context of a challenge to the TSO's tariffs mounted by a shipper.
- On behalf of Shannon LNG in Ireland Mr. Harris has undertaken analysis of proposals to change the tariff charged for use of the gas pipeline between GB and Ireland. The work included preparing responses to consultation documents issued by the regulator, as well as analysing the proposals to see if they conform to the relevant regulations and previous decisions by the regulator.
- For the Colombian energy regulator (CREG), Mr. Harris led a team of Brattle consultants advising on the reform of trading arrangements for gas and transport capacity in the Colombian market. The reports were published as part of a consultation exercise, and Mr. Harris presented the results to industry participants and government.
- For the Dutch energy regulator (the Energiekamer) Mr. Harris led a study which critiqued the regulator's proposed method regarding the addition of connection costs to the Dutch gas distribution networks' asset bases. The regulator subsequently published the study as part of a consultation process.
- Mr. Harris advised the gas Transmission System Operator in Belgium regarding the benefits of a more liquid gas market, how to define when trading is sufficient that these benefits might materialise, and which factors could contribute to this growth in liquidity including merging with a neighbouring entry-exit zone.

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- Mr. Harris managed a project for the Belgian gas pipeline company, Fluxys, on whether transit services should be priced differently to domestic transportation. The study identified risks that are faced by transit pipelines but not by domestic pipelines. The work drew on international precedent and examples regarding the treatment of transit tariffs.
- Mr. Harris led a study for the Dutch Ministry of Economic Affairs on the economic impact of the Dutch gas hub strategy. The study quantified the current contribution of the Dutch gas sector to the economy, in terms of the effect on GDP and employment. The analysis estimated the investments required to realise the transit flows and other aspects of the Dutch gas hub strategy, such as investments in R&D and LNG terminals, and quantified the impacts of these investments on GDP and employment. The Dutch Ministry published the study in December 2010.
- For a major European energy company, Mr. Harris managed a study on the appropriate regulated asset base (RAB) for Gas Transport Services (the Dutch transmission system operator) which would be used by the Dutch energy regulator to derive gas transportation tariffs. He advised on alternative approaches and methodologies for calculating the RAB and what might/might not be an appropriate level for the RAB. The study considered several alternative approaches to setting the RAB and estimated the value of the RAB under each approach.
- Mr. Harris led a study to build a tariff model of an LNG terminal in the EU on behalf of a user of the terminal. The study involved critiquing the tariff methodology and estimating the parameters that contributed to the final tariff.
- For the UK energy regulator, Ofgem, Mr. Harris drafted an impact assessment of proposed reforms to the GB gas off take regime. The work addressed the comments of the Competition Commission, which had reviewed Ofgem's previous IA, and proposed alternative methods of quantitative analysis.
- For a private client, Mr. Harris undertook a study of a range of reasonable parameters to set gas tariffs in the Netherlands, and contributed to a model of Dutch gas tariffs which varied with inputs such as the allowed rate-of-return and the rate base.
- For a private client, Mr. Harris conducted a study of the main issues in the Dutch gas market, and potential barriers to establishing a gas supply chain in the Netherlands.
- Mr. Harris was part of the team which was commissioned to assess if the Regulated Asset Base (RAB) proposed by an EU regulator was 'reasonable' by performing a benchmarking exercise. The examined the RABs, tariffs and allowed rates of return of several other Member State pipeline companies, and produced analysis which normalised the RABs accounting for larger network size and volumes of gas transported.
- For a private client, Mr. Harris advised a client that was interested in selling capacity in a LNG regasification terminal in Western Europe. Mr. Harris designed several spreadsheet models to value capacity in the UK, based on the idea that the key determinant of the terminal's value is the ability it gives LNG producers to 'arbitrage' Atlantic Basin LNG markets. The work also

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involved quantitative analysis of how the number of buyers for such capacity would change over the next few years.

- Mr. Harris worked for the user of an EU LNG terminal (which had a rTPA exemption) to develop an auction for 'spare' LNG slots, in particular a reserve price for the auction and how far in advance of the delivery date the auction should be held.
- For a large private client in Asia, Mr. Harris assessed the security of supply benefits of an LNG terminal compared to a policy of keeping non-gas-fired plant on the system.
- Mr. Harris has analysed security of supply issues for a major gas utility in the EU, conducting an 'N-1' analysis of the market and estimating the costs of alternative means of ensuring adequate gas supply security.
- Mr. Harris provided support to a European utility company considering a long-term gas purchase. The work included analysis of flexibility options, the most suitable form of price indexation, European gas supply and demand and an assessment of the stability of the company's portfolio over time.
- In a project for DTe, Mr. Harris derived estimates of likely future volumes and liquidity in the Dutch gas market, based on experience in US and UK gas markets.
- Mr. Harris carried out a detailed feasibility study for a proposed gas pipeline in Europe. In order to determine if the new pipeline was likely to be profitable, an analysis of the volume and cost of gas supply in North West Europe was carried out, several scenarios were developed, various regulatory strategies were considered and the impact for the project evaluated.
- On behalf of a gas transportation company, Mr. Harris conducted an investigation of market power and market definition for gas markets of different qualities. He helped to develop policy measures to increase the level of competition between the two gas qualities.
- At the request of DTe, Mr. Harris investigated the potential for wholesale competition in the Dutch gas market, following full market opening (liberalisation). Mr. Harris assessed barriers to market entry and policy measures which could facilitate entry. He also conducted a market definition exercise, consistent with the methodology laid out by the European Commission. The study was published by DTe.
- For Ofgem (the UK energy regulator), Mr. Harris conducted a case study of the gas balancing rules in the Dutch gas market, analysing how and why the balancing rules have changed in recent years. The work was published as part of an Ofgem document.
- Mr. Harris was a member of a study team analysing the case for changing the gas balancing rules in the UK (Transco) on behalf of Ofgem.
- Mr. Harris was part of a small team that designed the use-it-or-lose-it mechanism for an exempt LNG terminal in the UK.

Gas Experience – Storage

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- Mr. Harris led a team to estimate the future value of gas storage for a client in Central Europe, and compared this to the expected prices in the client's long-term storage contracts. Mr. Harris also analysed other aspects of the contracts, including indexation and the price review clause.
- For a major EU gas utility, Mr. Harris undertook a study evaluating alternative methods of setting tariffs for gas storage, benchmarked the proposed storage tariffs against other storages in the region, and valued the client's storage using software that employed option-based valuation techniques. Mr. Harris also evaluated the client's competitive position in the storage market, using alternative market and product definitions.
- In support of an application for exemption from TPA, Mr. Harris defined the market for storage in Belgium, and explained that storage competes in the same market as other sources of peak gas supply.
- For a Dutch utility considering an investment in a gas storage project, Mr. Harris analysed the supply of and demand for peak capacity in the Netherlands, and identified the key risks to the future value of gas storage facilities in the Netherlands.
- While at Shell, Mr Harris was part of the planning and development team for gas infrastructure in the Dutch gas market, including gas storages. Mr Harris regularly carried out economics analyses of proposed new gas storages, and compared these with other alternative projects such as investment in gas compression on production fields. Mr. Harris was also part of a small team that of Shell/Gasunie staff that determined the infrastructure projects required over a thirty year planning horizon. Mr Harris also supervised capacity tests of Shell's Dutch storage plants.

Electricity Experience

- For Terna, the Italian TSO, Mr. Harris was part of a Brattle team that carried out a detailed design of the new Italian capacity market. The work included defining the Peak Energy Rent reduction mechanisms, advise on market monitoring and mitigation of market power, definition of the capacity demand curve, and the definition of the auction clearing and price setting process. Terna submitted the report to the Italian energy regulator.
- Mr. Harris co-authored a paper for a major European energy utility which proposed reforms to Russia's system of capacity payments and reforms to the capacity market in Russia.
- For the Ministry of Economic Affairs in the Netherlands, Mr. Harris co-authored a report proposing and evaluating alternative congestion management mechanisms for the Dutch electricity system. The work included a detailed assessment of the economics of each scheme including market power. The report recommended a model of congestion management, and was submitted to Dutch parliamentarians as part of a briefing before they voted on the required changes in law.
- Together with a colleague, Mr. Harris carried an analysis of the costs and benefits for Ofgem on the effect of the proposed 'P229' modification which would introduce zonal losses to GB transmission charges. Mr. Harris undertook an analysis of the effect of the proposal on

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consumers and embedded generators, and whether the proposals would provide a disincentive to renewable generators.

- Together with a colleague, Mr. Harris carried out an impact assessment for Ofgem on the effect of the proposed 'CAP148' modifications which would accelerate the connections of renewable generators. The work identified and quantified the different economic effects of the modification proposals. Ofgem used Mr. Harris's analysis as the basis of its public impact assessment.
- For TenneT, Mr. Harris analysed the current generator connection policy, surveyed connection policies in other jurisdictions such as GB and the USA, and developed alternative connection policies for TenneT.
- For the Ministry of Economic Affairs in the Netherlands, Mr. Harris carried out a study on the application of locational signals in transmission tariffs in north-west Europe. The study assessed the need for locational signals in Europe by looking at how generation would be re-distributed geographically in the next few years, estimated the likely effectiveness of locational signals for different types of generators, and made policy recommendations for the Dutch government.
- For a client in Singapore Mr. Harris undertook a study to investigate the effect of reallocating capacity rights on a pipeline importing gas. The study included modelling of the Singapore electricity market and a forecast of the effect of the capacity allocation on electricity prices and consumers.
- At the request of Ofgem, Mr. Harris undertook a review of an assessment which another consultancy had carried out on the impact of a system of zonal losses. The review considered if the methods used were appropriate and if changes which had occurred since the review was carried out were material enough to affect the conclusions. The review which Mr. Harris co-authored was recently passed onto the consultancy for review.
- On behalf of the European Transmission System Operators association (ETSO), Mr Harris carried out a study on the locational signals given to generators in Europe. The study examined when locational signals are likely to be efficient, and when they should harmonised between TSOs.
- For the Dutch Ministry of Economic Affairs, Mr. Harris contributed to the detailed design of long-term reserve contracts. The work included evaluating the optimum form of the reserve service and the design of the auction to sell the contracts. The Ministry subsequently adopted The Brattle Group's recommendations and published the report.
- Mr Harris conducted a study on whether conditions in Belgium are suitable for establishing a day-ahead market. He assessed the likely level of liquidity on a Belgium day-ahead market, whether the holding of generating capacity was sufficiently diverse and interaction with the Belgian balancing market rules. He also examined the options for integrating with neighbouring power exchanges, including an analysis of market power and transmission constraints. The study was published by the Amsterdam Power Exchange and Elia (the Belgian TSO).

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- APX and TenneT wished to investigate the feasibility of integrating the Dutch and Belgian day-ahead electricity markets. Mr Harris conducted an investigation into alternative market structures, such as a single market or a market coupling mechanism. He evaluated the impact of market power in any new market arrangements, interaction with balancing markets and transmission constraints.
- For DTe, Mr. Harris has investigated the benefits and alternative mechanisms to integrate the balancing markets of Belgium and the Netherlands.
- For a group of utilities in an EU Member State, Mr. Harris contributed to study examining alternative ownership structures for network companies and their affiliated supply divisions that would overcome the Government's discrimination concerns.
- On behalf of a private company, Mr. Harris helped evaluate the economics of the generation market in Singapore, and advised how the current market conditions could affect generation asset values.
- Mr Harris co-authored a report which examined the implications of Ireland's new electricity market for Renewable Energy generators, in particular wind-powered generators. Mr. Harris examined how the proposed market rules would affect renewable generators, and proposed alternative policies.
- At the request of the Dutch energy regulator (DTe), Mr Harris investigated the feasibility of an Operating Reserves market. Mr Harris assisted with market design, modelling of reserve market prices, identifying problems and designing recommendations for the reserve market.
- At the request of DTe, Mr. Harris developed and modelled medium term scenarios for the Dutch and neighbouring power markets. The modelling focused on the price effects of mergers, changes in fuel prices, installed capacity and environmental regulations.
- On behalf of a private client, Mr Harris carried out a Benchmarking study of Belgian medium voltage distribution tariffs.
- Mr Harris designed a process for the sale of Virtual Independent Power Plants (VIPPs) for a Member State. The work included detailed case studies of the Irish and French VIPP auction processes.
- Mr. Harris led a team to review the gas tariffs and tariff structure of Member State Transmission System Operator. The study will establish the new tariffs, the allowed rate of return for the TSO and the form of the gas transportation tariffs.
- For the Dutch Energy Regulator (Energiekamer), Mr. Harris critiqued a proposed method decision regarding the addition of connection costs to the Dutch gas distribution networks' asset bases. Mr. Harris led the analysis to challenge the assumptions made in the methodology and investigate the effect of alternative methodologies. The regulator subsequently published the study as part of a consultation process.

Electricity Experience – Interconnectors

- Mr. Harris is currently part of a team estimating the revenues of a new interconnector between two Member States.
- For a TSO and a power exchange, Mr. Harris developed a model to evaluate the benefits of alternative trading arrangements for trading across a cable between Norway and the Netherlands (the Norned cable). The work involved developing mathematical models of the trading options, and quantifying the allocation of rents between trading profit, cable owner profit and social welfare.
- For TSOs in several Member States, Mr. Harris has carried out electricity market modelling work to estimate the revenues across two separate proposed electrical interconnector projects. The work involved modelling of European electricity markets out to 2030, the creation of a number of scenarios regarding the ability of generators to recover their fixed costs, and the modelling of ‘random’ events such as plant outages which create value for interconnectors.
- For a private client, Mr. Harris helped value the proposed interconnector between the Republic of Ireland and Wales.
- On behalf of a private client in the Netherlands, Mr Harris investigated the effect of the NorNed cable on competition and prices in the Dutch balancing market.
- For a group of electricity companies in the Netherlands, Mr. Harris reviewed a third-party’s estimates of the costs and benefits of the Norned cable. Mr. Harris’s report found several errors in the third-party’s analysis, and provided corrected estimates of the costs and benefits. Mr. Harris’s work was cited by the Dutch energy regulator in its decision on approving the Norned project.

PUBLICATIONS

“Risk and Return for Regulated Industries”, published by Elsevier, with Bente Villadsen, Mike Vilbert and Larry Kolbe, 1st May 2017, ISBN: 9780128125878.

“A Subject of Interest: Pre-award Interest Rates in International Arbitration” Dan Harris, Richard Caldwell, and M. Alexis Maniatis Published by The Brattle Group, Inc. June 1, 2015.

“A Tale of Two Crises: The Betas of EU Networks”, August 2013 Dan Harris and Francesco Lo Passo Published by The Brattle Group, Inc.

“International Experience in Pipeline Capacity Trading”, Dan Harris, Toby Brown, Alessandro Massolo, 5 August 2013, prepared for AEMO.

“The Difference Between Winning & Losing: Engaging the Vital Role of Expert Witnesses in Arbitration” Presented at ‘Successfully Negotiating & Renegotiating Long Term Gas Supply Contracts,’ July 2013 Berlin, Germany.

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'The WACC for the Dutch TSOs, DSOs, water companies and the Dutch Pilotage Organisation', Dan Harris, Bente Villadsen, Jack Stirzaker, 4 March 2013, prepared for NMa.

'Calculating the Equity Risk Premium and the Risk-free Rate' Dan Harris, Bente Villadsen, Francesco Lo Passo, 26 November 2012, prepared for the NMa and OPTA.

'Impact Assessment for the Framework Guidelines on Harmonised transmission tariff structures', Dan Harris, Penelope Wilson, 6 August 2012, prepared for ACER.

'Shift From Conventional To Unconventional Resources – What Does This Mean For Downstream Gas Players?' 27th – 28th March 2012: Unconventional Gas & Oil Global Summit, Warsaw, Poland.

'A Comparison of Anti-Manipulation Rules In US and EU Electricity And Natural Gas Markets: A Proposal For A Common Standard', with Shaun Ledgerwood, Energy Law Journal, Volume 33, No. 1 2012.

"REMIT: Issues For LNG trading", Presented to the LNG Global Conference September 27 2011

"Easing the Transition from Oil-Indexation," by Serena Hesmondhalgh and Dan Harris, Petroleum Economist, August 3, 2011.

"Research Into Gas Flexibility Services: Method Decision Flexibility Services," by Dan Harris, José Antonio Garcia, and Ilinca Popescu, The Brattle Group Ltd, prepared for the NMa Energiekamer (NMa), August 2, 2011.

"What Can Be Done at a Commercial Level to Resolve Contractual Disputes?" Presented at 'Commercial and Legal Strategies for Managing Risk in Long Term Gas Supply Contracts,' taking place July 11-12 2011 Berlin, Germany.

"Defining Market Manipulation in a Post-REMIT World," by Shaun D. Ledgerwood, Dan Harris, Bin Zhou, and Pinar Bagci, The Brattle Group, Inc., June 2011. available at www.brattle.com.

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