



2012-2015 Triennium Work Report June 2015

PGCB SG3

Strategy and Regulation

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Introduction

The work undertaken by Program Committee B, Study Group 3, during the 2012-2015 Triennium, has consisted in analysing four different topics which make the report very diverse. In the first place, it was intended to continue the work of the prior triennium. For this reason, there is a dedicated part on Business Cases which tends to analyse whether there are synergies between regulation and the strategies of the companies. Questionnaires were distributed amongst IGU members of all segments of the gas value chain. Some interesting results have been found as a result of the questionnaires that were distributed amongst IGU members.

Due to the increasing interaction between ICER and IGU, the group considered that there could be a potential role for IGU to provide some input to ICER on the current Investment Climate. ICER has also included this topic in the current work program, which is structured similarly to IGU's. Several interactions have taken place with ICER, who have expressed that the voice of the gas industry would be welcomed. The group has developed a position paper which will be used to voice the interests of the gas industry vis-à-vis ICER. In this respect, it is intended that once the paper is finalised, the document is distributed to the regulators and is presented at a workshop organised by ICER.

In view of the current global landscape, the group considered that there could be potential to collect project cases which are or have been successful, and whose project promoters entailed partnerships of IOCs & NOCs. In this sense, the group has gathered input from different project sponsors who have explained why these partnerships were successful in developing specific projects. Most projects sponsors have identified the same elements as being essential for a project to be successful.

Lastly, Energy Poverty has been the last topic to be studied. The economic crisis has been one of the factors that have put energy poverty at the core of the political agenda. Currently, many initiatives are being developed with regards to this issue, and the study group has tried, via a questionnaire, to understand the different situations and measures that countries are facing or have put in place across the world.

Finally, conclusions and recommendations from this exercise are provided.

Fethi ARABI, Chairman of PGC B



Acknowledgements

Hereby is the list of the leadership team who the IGU Programme Committee B, Study Group 3 on Strategy and Regulation would like to thank for their contribution and active participation.

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I. Business Cases

Purpose of the document: based on an assessment of a survey done at company level and taking into account the value chain elements, the paper will describe in a clear and concise way how regulation has an effect on the company's strategy.

Targeted audience: regulators and policy-makers

1. Introduction to the Business Cases

“A ‘business case’ is a form of advice substantiating an argument or a proposal”

Regulation is well known and even feared by its name alone. It creates, it limits, it constrains a right, it creates or limits a duty, it allocates a responsibility, etc. In every way regulation forms the landscape in which companies are operating and by doing this regulation might as well be one of the driving forces that shape the strategy of the companies.

The way in which the current policy landscape influences companies presumably depends a lot on the position within the value chain. For some of the elements in the value chain that are to be considered monopoly's (for instance: distribution system operators - DSO, Transmission system operator - TSO and LNG system operator – (LSO) regulation is partly aimed at ensuring third party access (negotiated third party access - nTPA or regulated third party access - rTPA) to the grid and partly aimed at regulating the tariffs for this access. Other elements of the value chain, for instance exploration and production - E&P, are restricted by regulatory rules on other topics regarding for example the environment or transportation. In the first case it shapes the market by market rules, in the second case it shapes companies by setting rules how companies should operate.

The primary goal of this paper is to look into regulations throughout the energy value chain, throughout the different IGU-areas and inform the reader about the differences in regulations and where it is heading to. This section, aims to find a common denominator, to formulate lessons learned and propose adequate changes.

The main question to be answered in this paper is “Do regulations influence the strategy of companies and in which way?” From this the derived sub-questions were formulated “How is regulation characterised?” and “what are the developments worldwide?”.

The pre-condition to answer the questions was that it should be based upon quantifiable results and it should also build on top of the previous work done by the study group B3.

The secondary goal of this paper is to bind the audience; to allow it in an easy way (by answering the survey) to participate and contribute in future sessions.

2. Motivation, the work plan, scope and objective

Motivation

In the recent years substantial changes to the gas market have been observed, influenced by:

- Political trends, and or
- Economic trends, and or
- Technical trends.

In the EU for instance the liberalisation drives new regulatory rules. A typical example of this is the mandatory unbundling requirements that were included in the so called Third Energy Package in which TSOs had to unbundle from their mother companies and choose between three regimes, i.e. Ownership

Unbundling (OU), Independent System Operator (ISO), or Independent Transmission Operator (ITO). In some countries the DSO's face the same regime. When talking to companies that operate within the energy value chain, the general feeling about regulations is that they tend to be rather restrictive and have been applied retroactively in the past making the regulatory framework unstable. In the value chain, companies that have activities downstream (like DSO's) are faced with new innovations like smart meters and the appearance of new market players (data-aggregators).

It is safe to say that different models for regulations (aimed at economic-, market- or technical rules) have different effects on the value chain as a whole. Of course the element of the value chain at which the regulations are aimed is more affected than its adjacent value chain elements.

Work plan

From the start in 2012 until the finishing work in 2015, the process roughly followed the following timeline:

- 2012 – Building on top of work done, discussing about the approach with the aid of the “The value chain analysis” done in the previous triennium from 2009-2012
- 2013 – Making of the Internet Survey, with both general questions (identification of value chain element, what kind of regulation, economics, etc.) and specific questions (Innovations, Investments)
- 2014 – Collecting and analysing of the data received, writing the report

Scope

The scope can be described as: “exploring in more depth the impact of regulation on corporate strategies for companies involved in each part of the gas chain”. The focus will be on those issues that have a major impact on the global gas market, either because regulation affects international trade and investment, or because the regulatory controls set a new benchmark for activities in several countries.

Objective

The objective of the business cases is to analyse the regulatory regimes in various segments of the gas value chain. Describe the experiences of companies in several countries aiming to find the common denominator. Formulate the lessons learned by deriving practical conclusions in relation to regulatory arrangements and propose adequate changes.

3. The framework, the IGU PGC B3 survey overview

Why has a survey been chosen as the tool to gather data? a survey is a relative quick and easy way to collect data that can be analysed. The use of a standardised survey also provides a sound basis to continue this in the future.

What is the scope of the survey? This survey is aiming at the energy value chain (see Figure 1. - the gas value chain), by doing so it is building on top of work done earlier by the IGU SGB3 (the 2009-2012 PGC B3 “Analysis of the energy value chain”). Out of scope are Logistics, Construction and Contracting.

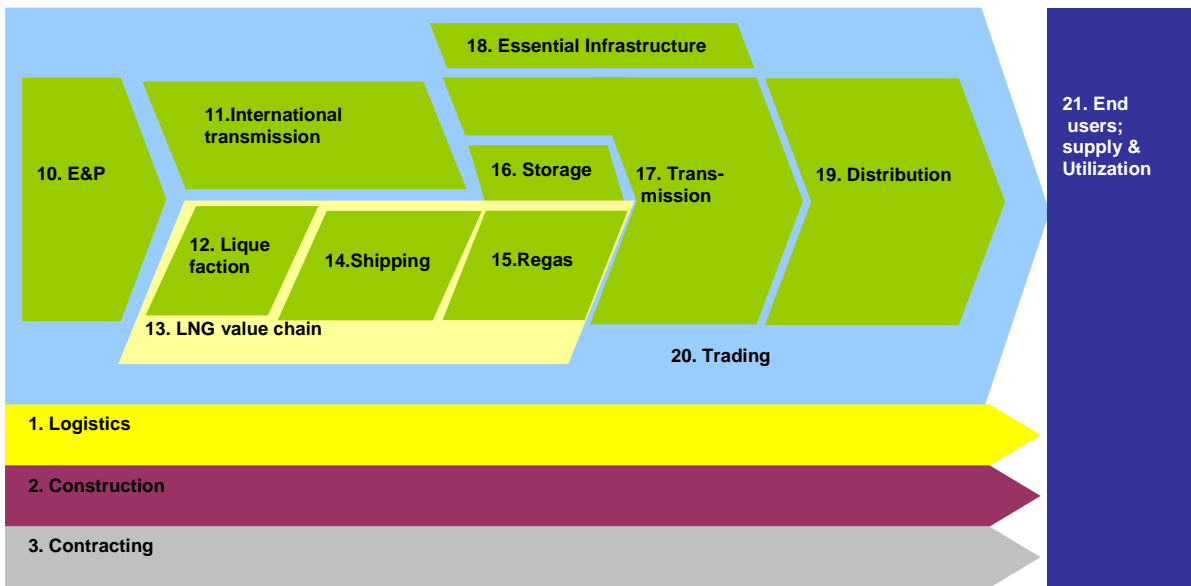


Figure 1: The gas value chain

What sort of questions is being asked? The survey is asking questions on two subjects¹ First the questions used in the survey are aimed to understand the general identification of the regulatory system. Secondly there were a set of questions on specific issues in order to see if there is any relation between the regulatory system with innovations and investments.

1) General questions

- Identifying where the company is active in the value chain and what is its ownership structure.
- Identify which regulatory system is applicable, without going into details.
- Provide general information on the tariff regulation, without going into details.
- Identify which institutions are regulating the company.

2) Specific issues

- The influence that regulations have on innovations (asking for opinion).
- The shortcomings in regulations that are hampering innovation (asking for opinion).

¹ Annex 1. See annex 1 for the questionnaire in detail

The scope of the survey can be represented by figure 2

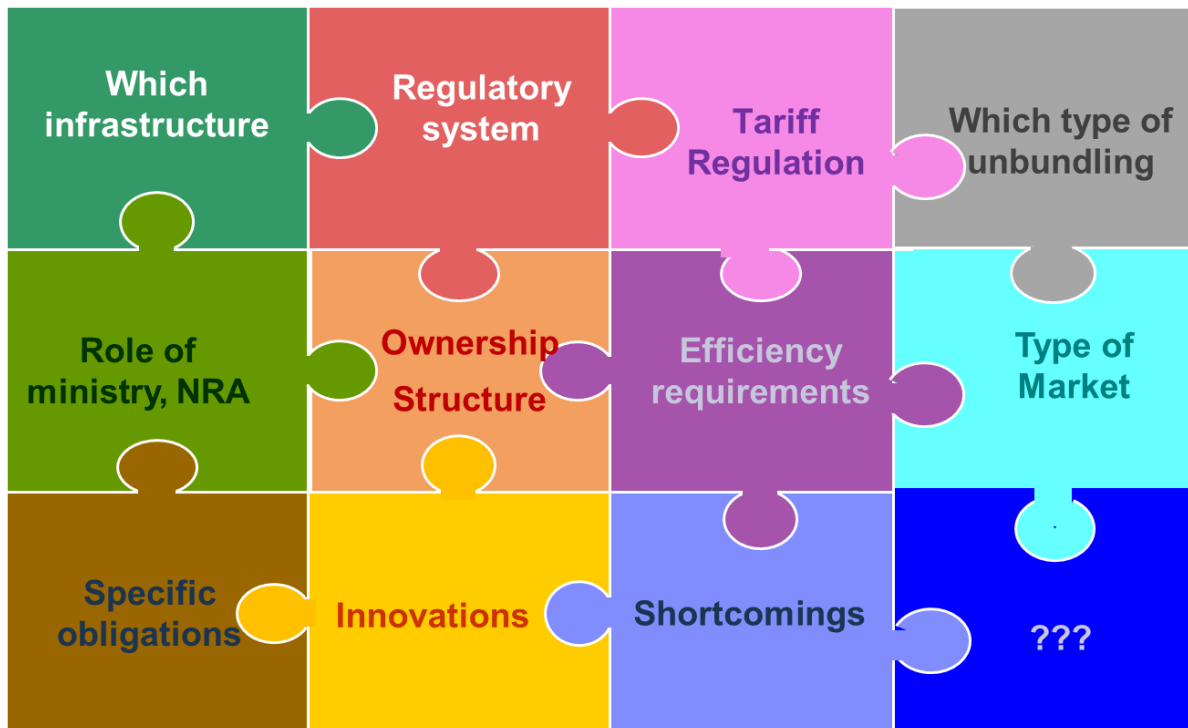


Figure 2 The scope of the survey

4. The first results

Overall there were 48 individual responses received. However the responses can be regrouped in 19 as many companies participate in more than one element of the value chain. It also needs to be taken into account that not all segments of the value chain were covered.

Value chain element	#	%
10: Exploration and Production	1	2%
11: International transmission	3	6%
13: Liquefaction	3	6%
15: Regasification	2	4%
16: Storage	7	15%
17: Transmission	15	31%
19: Distribution	10	21%
20: Trading	5	10%
21: End users	2	4%
Total	48	100%

Global coverage and ownership

The majority of responses came from Europe, the rest from Asia. No response was received from Africa, Asia-pacific, the CIS-countries or the America's. 50% of the responses were received from publicly owned companies, 40% are private and 10% has a mixed ownership.

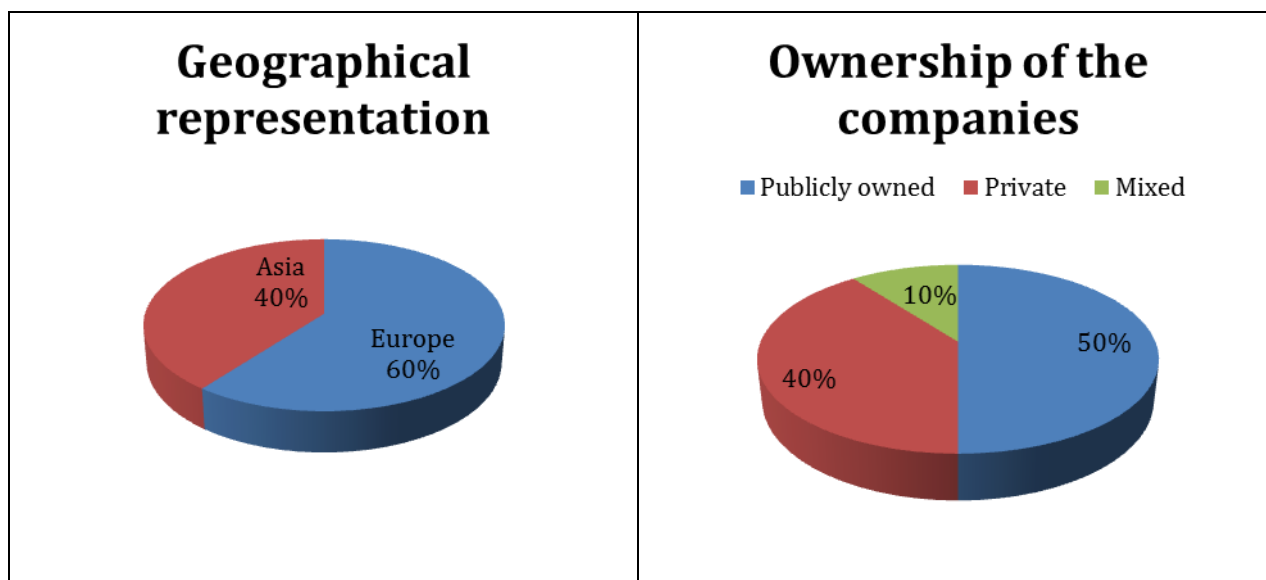


Figure 3 Geographical representation & Ownership

Important: the limitation of 2 geographical areas and the amount of responses received means that there is not enough information available to make a meaningful statistical analysis.

Therefore we limit ourselves to provide an overview of the responses without making any statement on the influence of regulations on strategy

Third party access (TPA) regulation

On the question if TPA regulations is applicable, the answer shows minor differences at TPA regulations between Europe and Asia. In Europe all answers – with the exception of regasification (2 responses) have TPA regulation rules. In Asia some of the downstream activities (storage, transmission, and distribution) do not have TPA regulation in place.

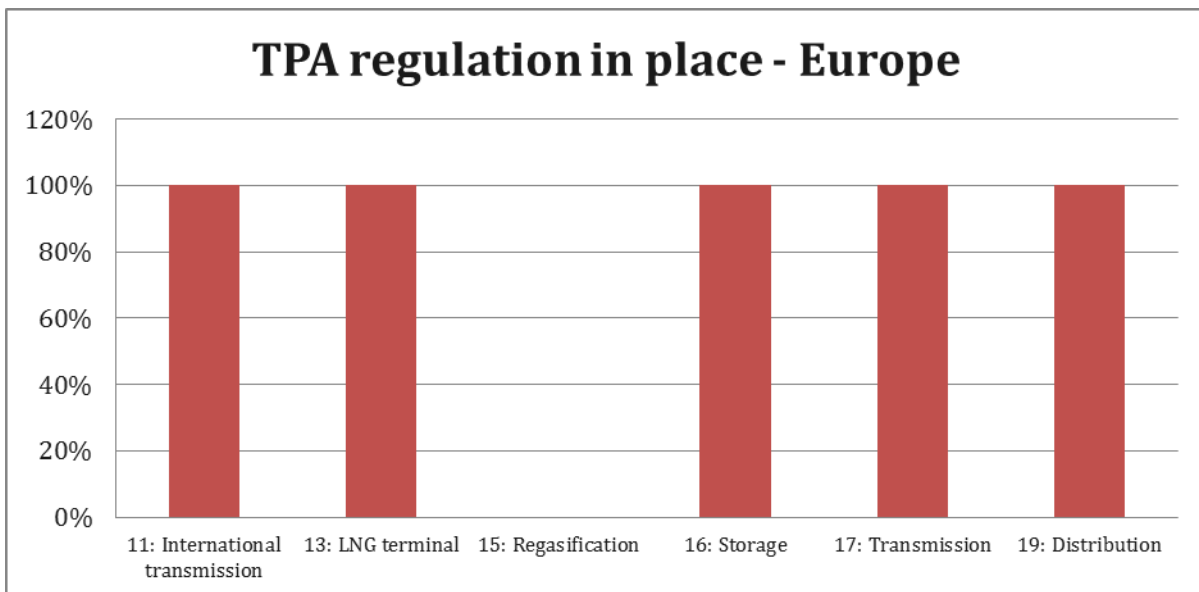


Figure 4 TPA regulation in Europe

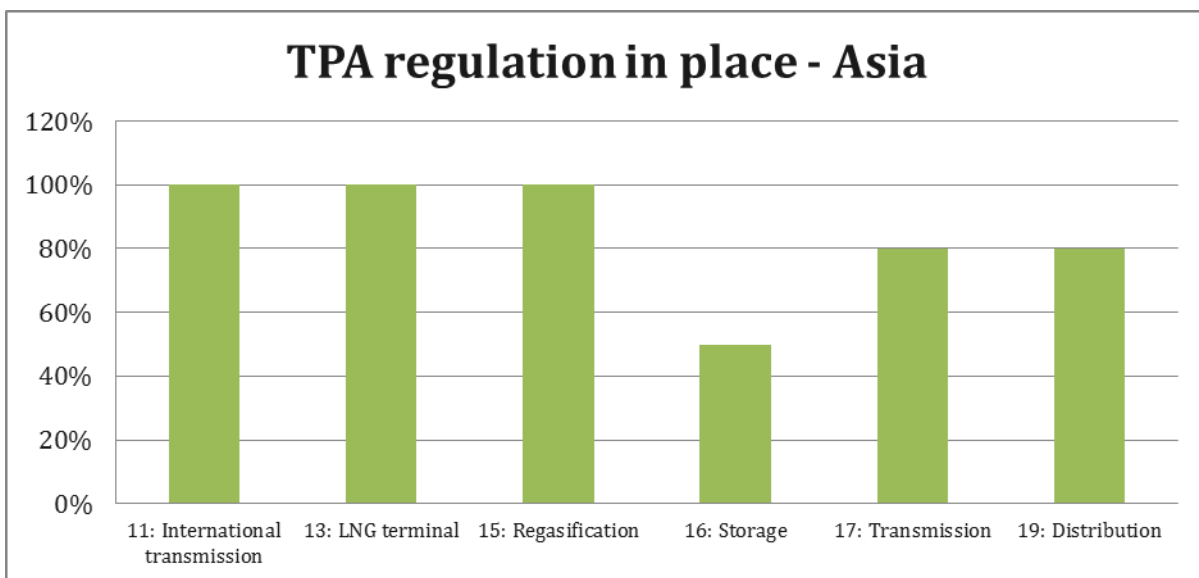


Figure 5 TPA regulation in Asia

Investment regulation

On the question whether there is specific regulation in place for investments, it can be seen that there are large differences between Europe and Asia. It has to be noted that there were no questions aimed to clarify the difference between Europe and Asia or questions that investigate what investment regulation exactly is.

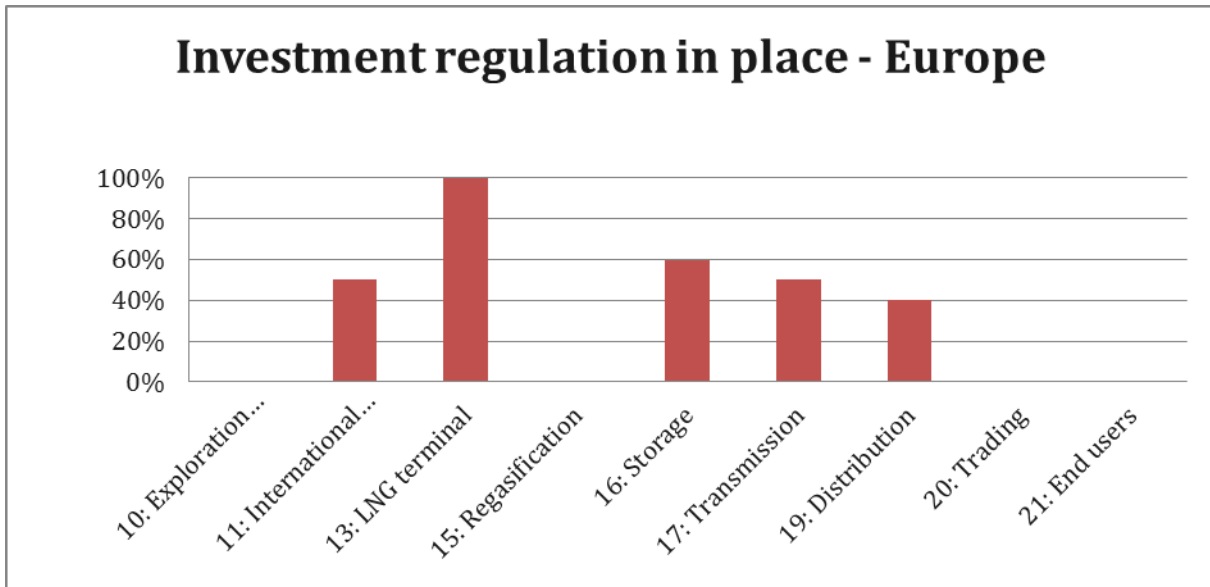


Figure 6 Investment Regulation in Europe

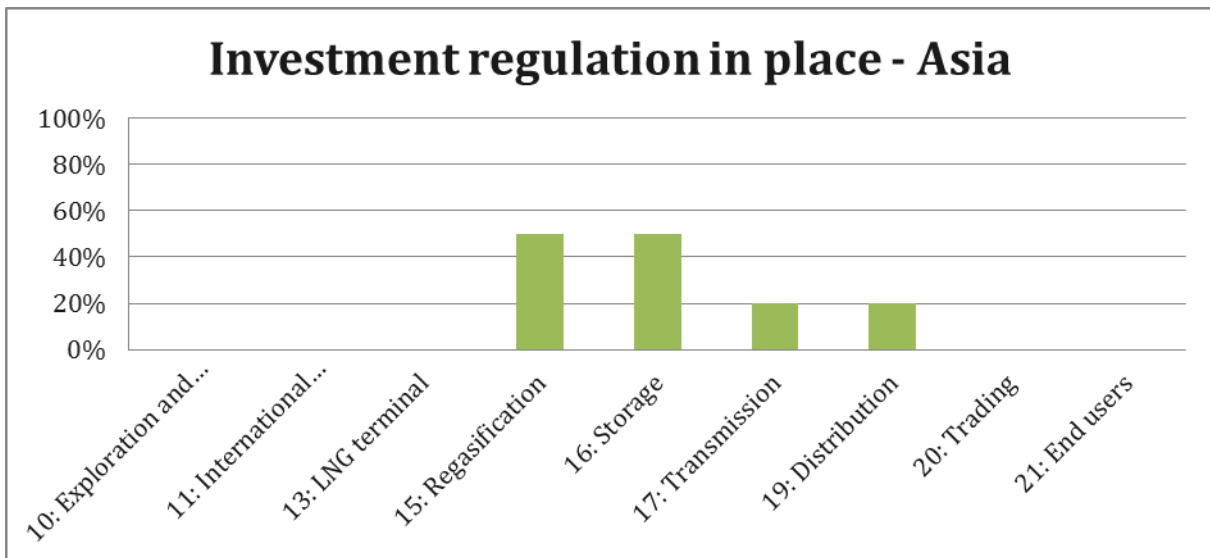


Figure 7 Investment Regulation in Asia

Unbundling requirements

There are also large differences regarding unbundling requirements between Europe and Asia. In general the levels of unbundling are higher in Europe than in Asia. Also here there were no questions aimed to clarify the difference between Europe and Asia or questions that investigate what the unbundling requirements exactly are.

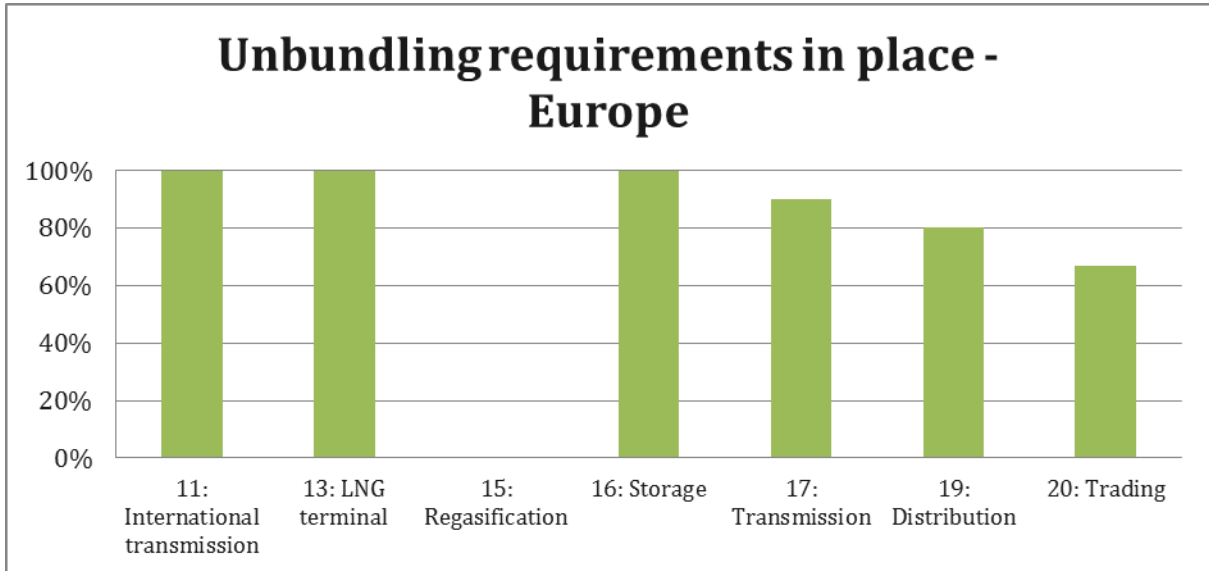


Figure 8 Unbundling requirements in Asia

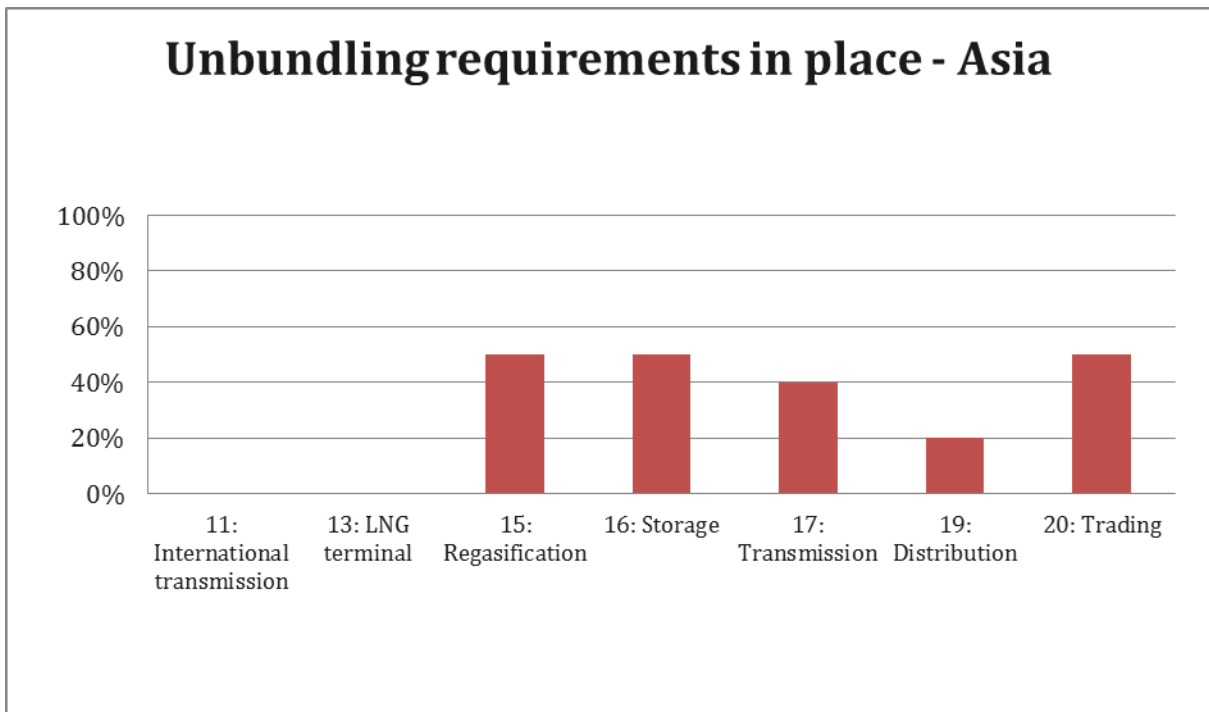


Figure 9 Unbundling requirements in Asia

Methods used for tariff regulation

When looking at the dataset as a whole an interesting mix of tariff regulations techniques is being used. Price cap tariff regulation is widespread with a hybrid revenue cap/rate of return as the second most popular option amongst respondents.

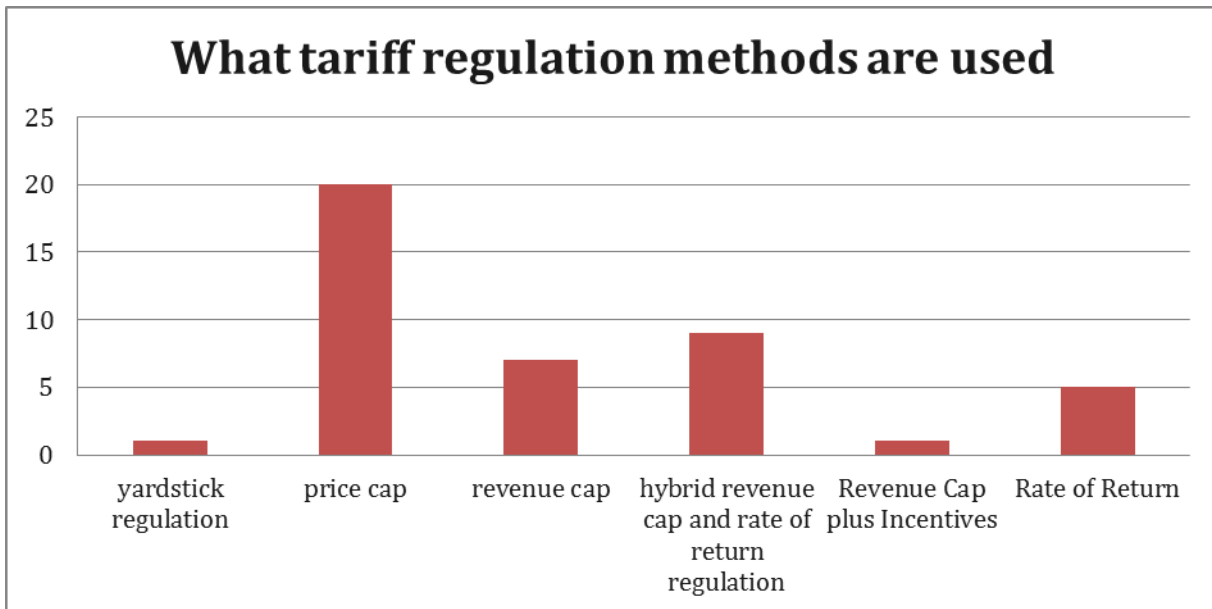


Figure 10 Types of tariff reuglation

Rate of return and satisfaction

The rate of return in Asia is slightly higher than the rate of return in Europe, also the satisfaction with the rate of return is higher in Asia when compared to Europe.

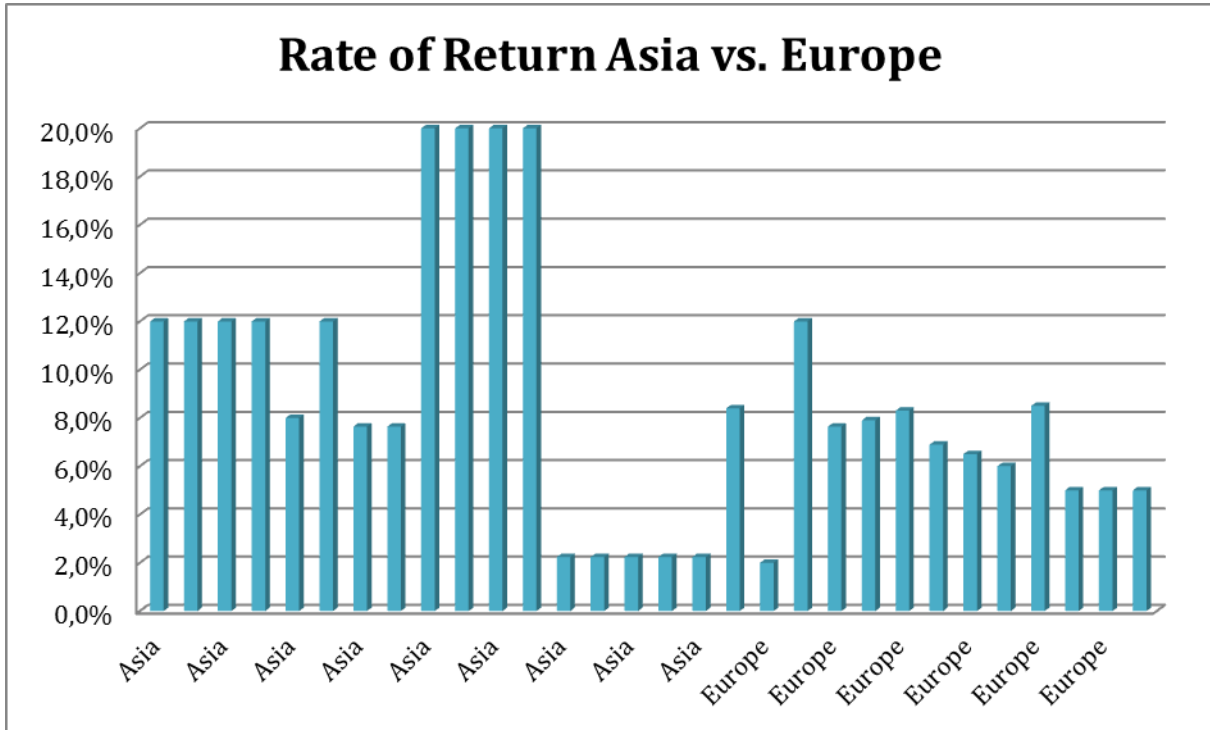


Figure 11 Rates of Returns per region

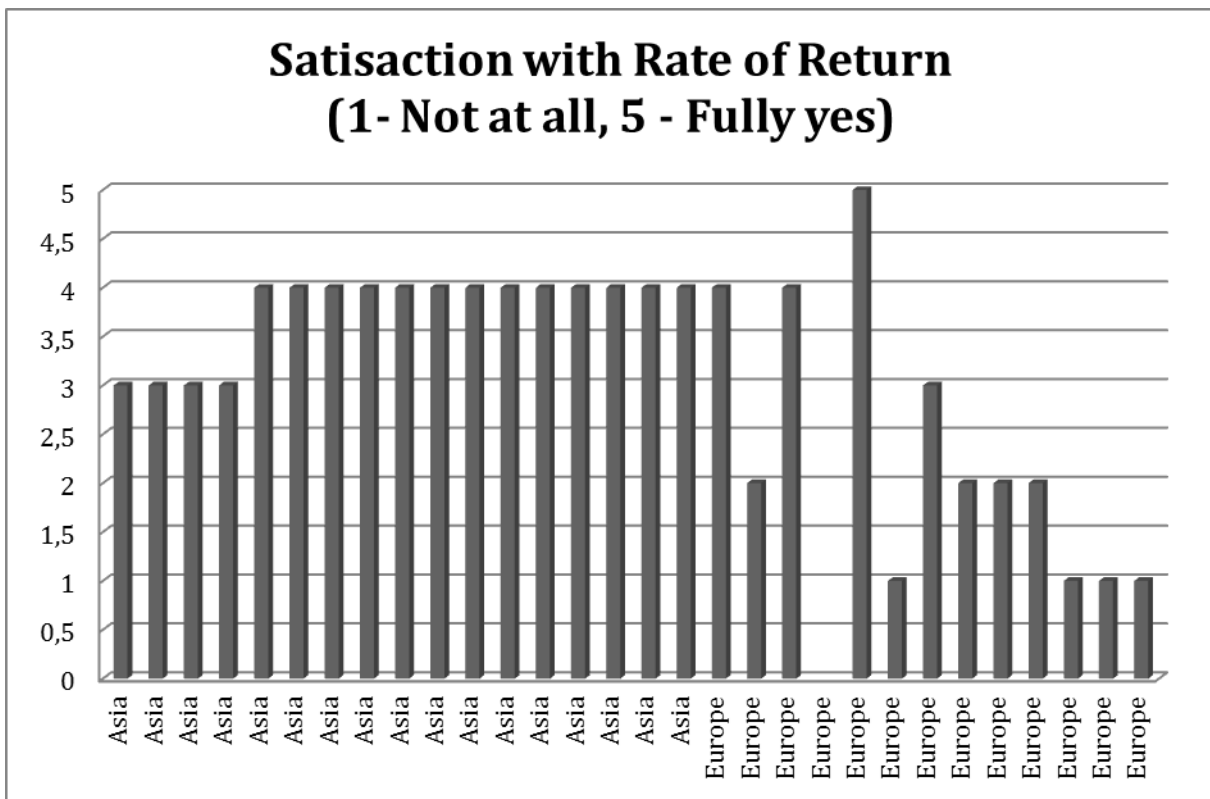


Figure 12 Satisfaction with RoR

Role of the National Regulatory Authority(NRA)

In most cases the NRA is the organisation who is responsible for regulation, followed by the ministry. In general the NRA is considered to be sufficiently independent from policy decisions.

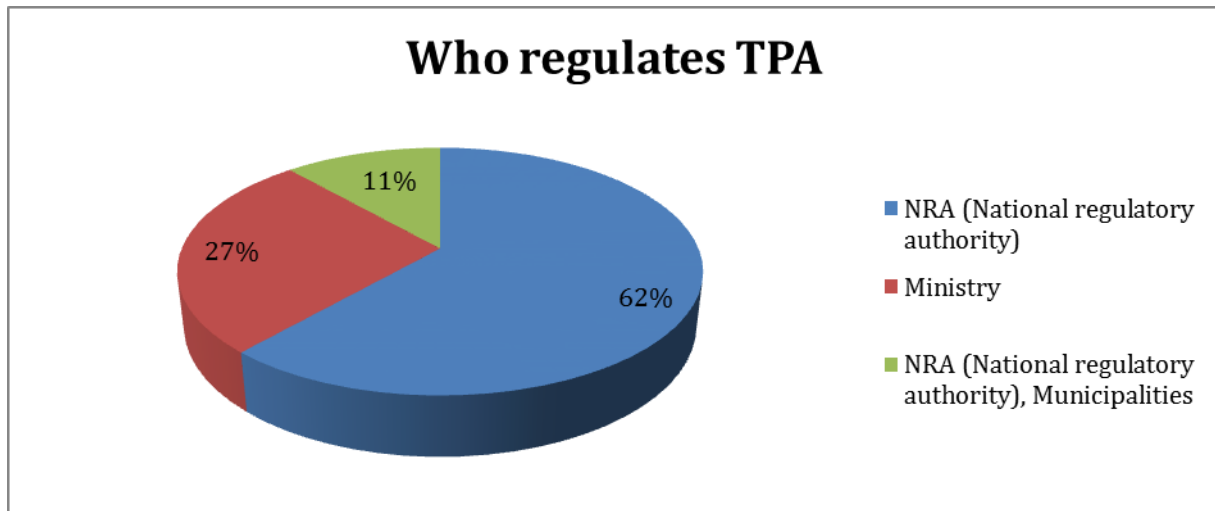


Figure 13 Regulatory entities

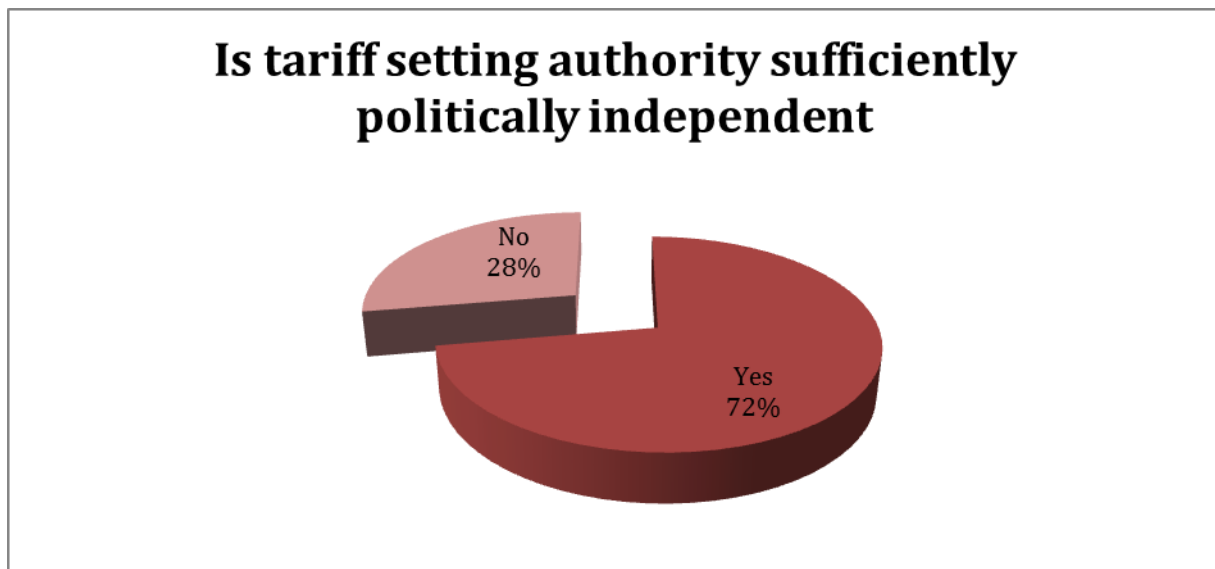


Figure 14 Political Independence from tariff setting

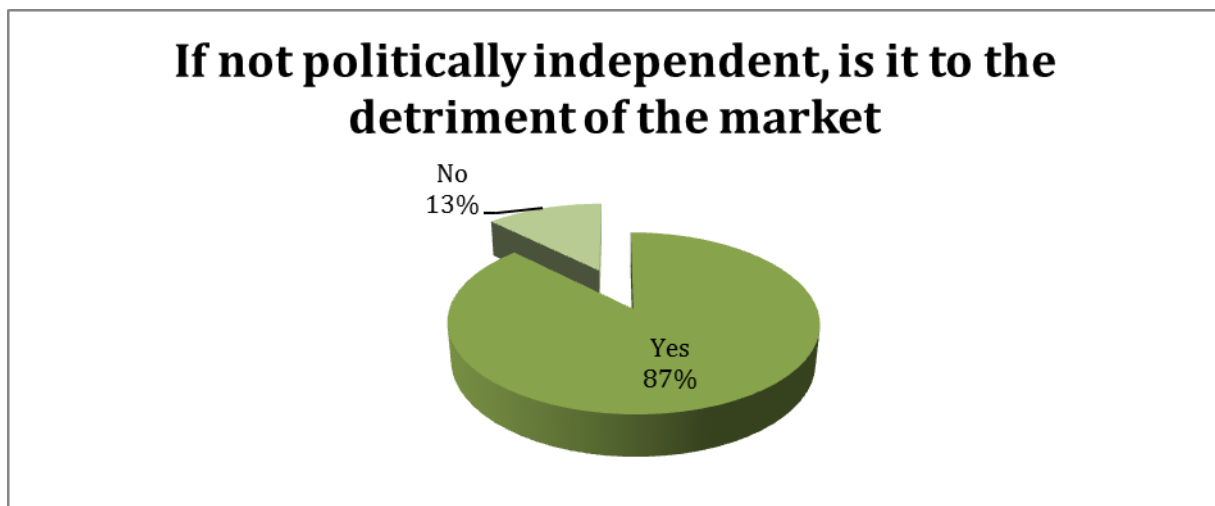


Figure 15 Impact of political dependence in the market

Stability of regulatory framework

The question is the regulatory frame work is perceived to be stable shows an interesting result. There are two “spikes”, one is at “rather more unstable” the other one is at “rather stable”. There was no further analysis on the data.

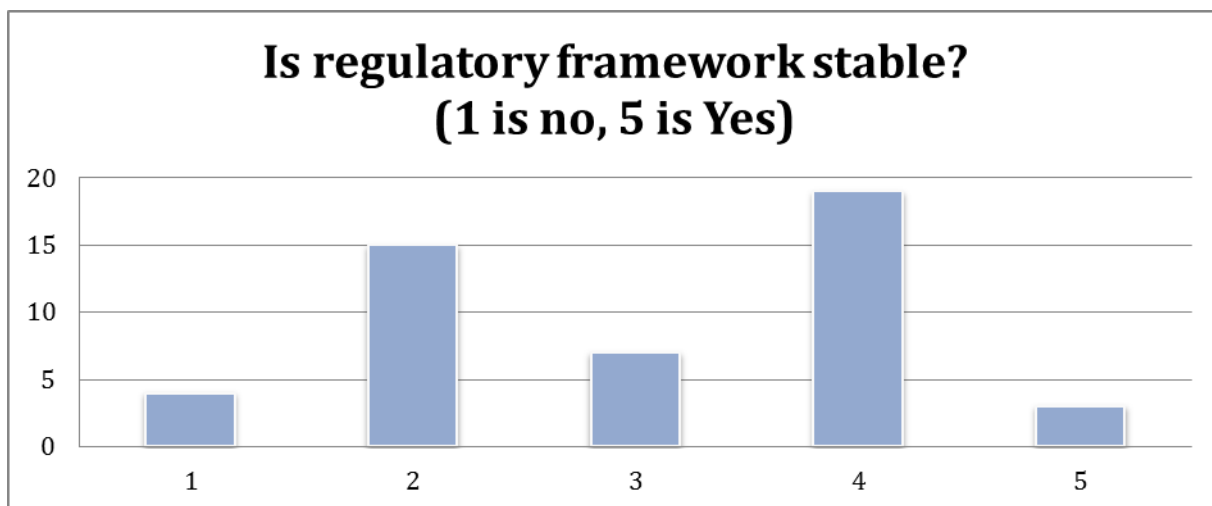


Figure 16 Stability of the regulatory framework

Relation with rate of return

An interesting answer is also received on the the satisfaction of the Rate or Return (RoR). This appears to be independent with the ownership structure (public, private or mixed) and also independent of the maturity of the market.

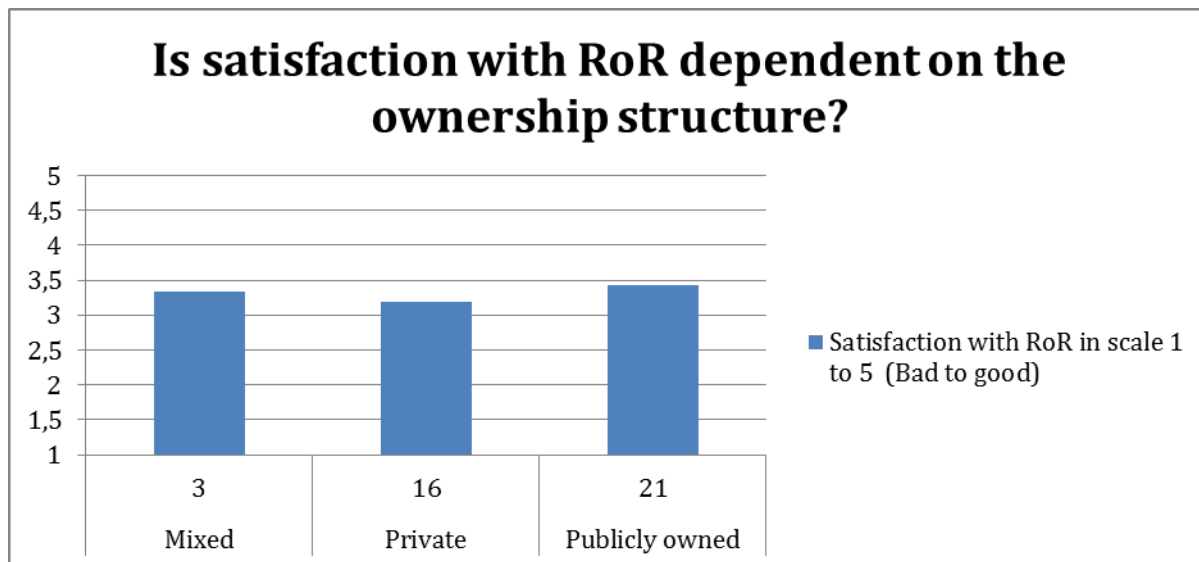


Figure 17 RoR Satisfaction/ownership structure

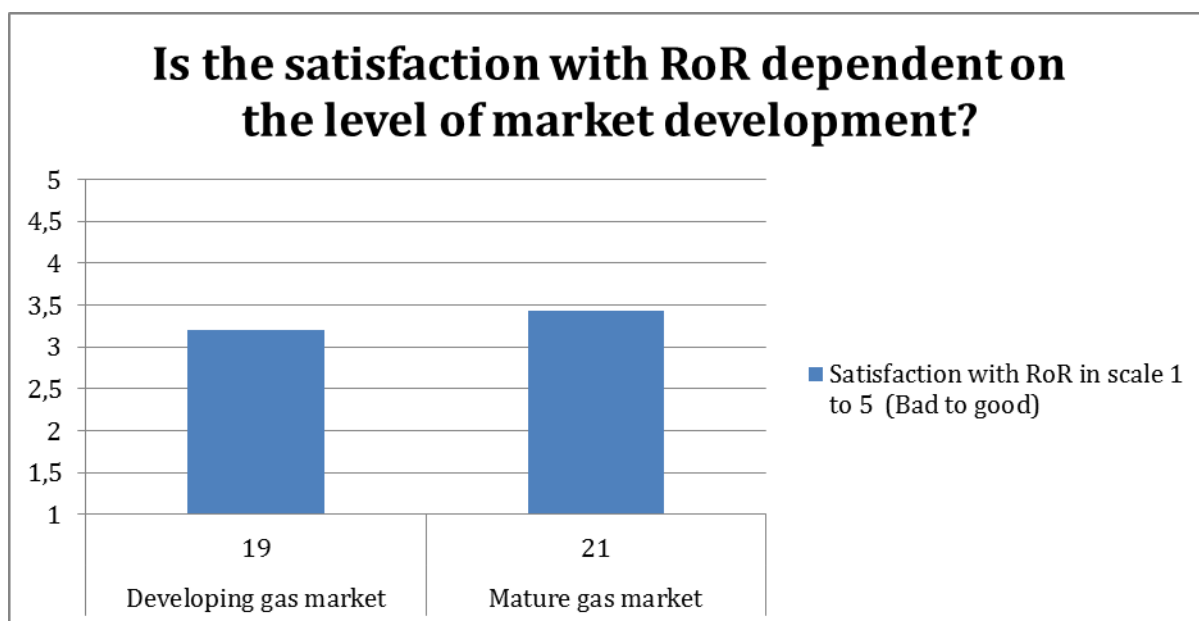


Figure 18 RoR Satisfaction/market development

5. Conclusion and follow-up

The objective of the study done by IGU PGC B3 was to look at regulations throughout the energy value chain, throughout the different IGU-areas and to inform about the differences in regulations and where it is heading to. Aiming to find a common denominator, to formulate lessons learned and propose adequate changes.

The way to obtain useful, statistical data by means of a survey has shown to be a good way of collecting these valuable, objective data. The results shows some interesting facts – however it is important to note that the limited amount of data makes it difficult to get to the conclusions.

To make a good generalisation on the relation between regulation and strategy we need to be careful and best to avoid it at all. We can say that on the data received we see interesting similarities and differences between Europe and Asia.

Taking into respect the available data:

- Both Europe and Asia have TPA regulations,
- Both have unbundling requirements although in Europe it appears to be more widespread,
- A large majority considers the Regulatory Authority to be politically independent
- The regulatory framework is considered to be stable, but with a large spread
- The satisfaction of RoR is independent of ownership structure or market maturity

The lessons learned about the process.

- Survey, good idea but keep it to only one format (no Excel and another).
- Start early, or have enough manpower to do the job.
- Keep it simple.

The obvious conclusions about the follow-up:

- The results from this limited amount of data are an encouragement to go for more; so in the next triennium we intend to follow up this subject.
- Some answers lead to more questions about details in the background, therefore we are going to enhanced the questions for the next triennium.
- It is clear that to make good conclusions more answers and better geographical coverage is absolutely necessary.
- And last but not least it was fun to make and next time we will try to improve that at well.

II. ICER-IGU Cooperation on Investment Climate

While the focus of this section is very much on the European perspective and more particularly on the regulated sectors of the gas industry the issues addressed equally apply in other regulated regions and countries but perhaps less so in areas where little or no economic regulation of activities exists.

The situation pertaining in Europe, where there is a high level of regulation of many aspect of the natural gas industry is one area where regional and national policy is potentially mitigating against the most cost efficient achievement of climate/energy goals. Given this high level of regulation a high degree of transparency is evident and therefore there is the ability to observe such aspects investment plans, demand data, policy in development and in practice.

Natural gas has much potential that is yet to be fully realised:

- Increasing the share of Natural Gas in the power generation mix can significantly reduce emissions.
- Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) present road and maritime transport sectors with significant opportunities to reduce costs while also significantly reducing emissions
- Gas-fired micro combined-heat-and-power (CHP) generators can provide local heating and electricity at high efficiency factors.
- Fuel cells can provide residential heating and electricity at high efficiency factors.
- “Power to Gas” technology can store energy in large volumes

In order to realise the full potential of gas infrastructure, a number of key areas of energy policy need to be addressed. These include

- Clear, consistent, and enduring policies are required from EU Policy makers that a single Natural Gas market will benefit all stakeholders, enhance the security of supply and play - a key role in the future of the EU Energy mix. A single, legally binding greenhouse gas emission reduction target of 40% is appropriate.
- The EU Emissions Trading Scheme (ETS) should remain as the primary EU mechanism for CO₂ reduction as, under the right conditions it can facilitate the most cost-effective path to carbon reduction
 - Appropriate and equivalent measures are also required for the non-ETS sector.
- Subsidies for mature renewable technologies in the power generation sector should be eliminated. They distort the Internal Energy Market and can even be counter-productive as they divert capital from R&D support for new lower-carbon technologies e.g. Power to Gas.

1. The Current Investment Climate

A market-based approach should be the cornerstone of investments in gas infrastructure. Regulated infrastructure has long been an attractive investment option - for investors who value the stable, long term returns. Regulated Natural Gas Transmission Infrastructure is typically depreciated evenly over a 40 to 60 year period and should therefore be ideally placed to attract long-term investment. However, this situation is being undermined by a number of factors at the current time, including national divergences in the application of the 20-20-20 rule, absence of visibility regarding the most likely level of European gas demand in the medium term and contradictory National Energy Policies and Strategies that are creating market distortions and which are not in-line with the ambition to create an internal EU energy market. There is a distinction between investors who are prepared to provide capital for new, long term investment and those who would purchase existing, mature infrastructure and seek to extract returns over a five to ten year timeframe.

Natural Gas and in particular the Natural Gas Transmission Sector can substantially contribute to achieving the goals of the EU Energy Policy both now and long into the future if some of the fundamental issues highlighted above are sufficiently addressed.

2. Recovery of Long Term Investment in the Low Carbon Economy and Long Term Viability for Investors

Regulatory consistency and predictability are essential to attract investors. For Regulated companies, it is the governing ministry and the National Regulatory Authorities (NRAs) that are best placed to guarantee a stable and understandable regulatory framework in Europe. The ministries set the National policy objectives, which are then implemented and enacted by the NRAs. The EC and ACER have a vital role to play in ensuring that EU Energy policy is consistently applied in member states. The NRAs and governing ministries need to work together to set clear, long-term policy objectives that ensure that vital gas transmission pipeline infrastructure is viable into the future. Regulatory certainty can provide reassurance to capital providers that their investments will be sustainable and will lead to lower financing (and refinancing) costs for TSOs, the benefits of which will flow to end-consumers. Some examples of this can be found in the reaction of Ratings Agencies and Investment Firms to the proposed Regulatory Settlement from the Northern Ireland Authority for Utility Regulation for Phoenix Natural Gas Limited in 2012.

“Unfavourable tariff settlements or changes to the regulatory regime could increase the sector’s business risk in the long term, leading to negative rating action.” – FitchRatings²

“Some risks fall squarely on providers of finance to a regulated asset, such as the exercise by a regulator of discretionary powers within the agreed parameters of a settled regulatory system” – iCon Infrastructure LLP³

Close co-operation in terms of policy development between Government, NRAs and TSOs can greatly enhance the future for gas transmission infrastructure which will significantly contribute to broader EU

² http://www.competition-commission.org.uk/assets/competitioncommission/docs/2012/phoenix-natural-gas-limited/fitch_ratings.pdf

³ http://www.competition-commission.org.uk/assets/competitioncommission/docs/2012/phoenix-natural-gas-limited/icon_infrastructures_submission.pdf

energy policy objectives. A good example of this is the recent (2014) stress tests conducted by the European commission which among other scenarios considered the impacts of a complete halt of Russian gas imports into the EU for a period of 6 months. It included an impact analysis conducted by the European Network of Transportation System Operators (ENTSO) in collaboration with the International Energy Agency (IEA) and G-7 partner countries (US, Canada, Japan). Vice-President of the European Commission, responsible for Energy, Günther H. Oettinger said: *"This report shows that we are not waiting but do everything we can do to be prepared. For the very first time, we have a complete picture of the risks and possible solutions. If we work together, show solidarity and implement the recommendations of this report, no household in the EU has to be left out in the cold this winter."*

Natural Gas: Advantages and Challenges

TSOs are convinced that Natural Gas should play a significant *role* in the future EU sustainable energy mix and will provide a valuable contribution in the move towards a low-carbon energy system by the replacement of oil and coal.

There is a **much greater role for Natural Gas** than simply a flexible balancing and capacity backup to Renewable Energy Sources (RES) in a properly constituted and functioning internal energy market. Natural Gas is acknowledged as the strongest enabler of RES. Natural Gas Power Plants are flexible (time to full power generation capacity) and produce substantially less emissions (**CO₂, CO, NO_x, Particulates**⁴) than their coal or oil equivalents in Europe. **Switching coal-fired power plants to natural gas, EU power sector CO₂ emissions would be reduced by almost 60%⁵(810 million metric tonnes)**. This is a key benefit that gas infrastructure in general can provide to EU power sector decarbonisation initiatives **and** could provide a significant **step-change reduction in CO₂** and other Green House Gas (GHG) emissions.

As the most efficient and least emitting conventional generation fuel, Natural Gas should be seen as both the transition fuel for the low carbon economy and also as an enduring base-load fuel. **Natural Gas had proven worldwide reserves (at current production rates) at the end of 2012 / 56 years⁶** which will ensure that Natural Gas can continue to be a vital supply source for the EU Power Generation system. It is important to note that the reserves to production ratio for gas has remained stable over the past 20 years. The discovery of gas has kept pace with increasing production and use. Worldwide reserves are readily accessible to the EU through existing import pipelines, interconnectors and LNG import terminals and could become even more accessible under suitable regulatory conditions, i.e. full implementation of the internal market and a regulatory environment that acknowledged and promoted a viable long term future for natural gas infrastructure.

The existing natural gas system facilitates the transition to a low-carbon economy at sustainable energy prices in new areas of usage by rolling out new technologies, e.g.

⁴ <http://www.gasnaturally.eu/uploads/Modules/Publications/air-qualityfinal.pdf>

⁵ www.gasnaturally.eu/uploads/Modules/.../eu-policy-july-2011.pdf

⁶ Source: BP Statistical Review of World Energy 2014

- **Use of gas as a road transport fuel is a proven technology** with significant environmental advantages over conventional fuels (25% less CO₂, 60% less NO_x)⁷. In addition, the use of **LNG in maritime transport** is an area with significant potential for fuel and emission cost savings.
- Gas-fired micro combined-heat-and-power (CHP) generators or fuel cells can be installed in residential settings to provide electricity locally reducing the need for costly electricity grid expansion. Distributed gas generation can be a **complementary technology to decentralised RES** electricity generation.
- “Power-to-gas” technology enables the “storage” of RES in the natural gas system by using RES to produce synthetic gas from CO₂ and H₂ which can then be injected into the natural gas system. The **big advantage is that energy in the form of gas can be transported over long distances on a more economically and environmentally-friendly way than in the form of electricity. Energy in the form of gas can be also stored in large volumes.** Natural Gas pipelines are also subject to less public opposition than over-ground infrastructure. (Power to gas technology is still at its early stage of development, it is better to talk for example about LNG as a marine fuel or CNG for vehicles).

IGU believes that Gas transmission infrastructure can satisfy the potential demand arising from the utilisation of the gas power plants in place. Indeed the existing pipelines are designed and built to meet the potential peak energy requirements of the market. The peak requirements of flexible gas generation plant are likely to increase further as RES continues its penetration levels throughout Europe leading to a consequent requirement for further investment in natural gas infrastructure. The available gas transmission infrastructure is also a major enabler of energy storage as it connects UGS to the gas grid which will continue to be a significant and important backup to the Electricity Generation market.

The infrastructure to achieve the step change reduction in CO₂ emissions by reversing the move from gas to coal/lignite in power generation is already in place. The facts show that some relatively new CCGT plants are being mothballed, and in some cases being decommissioned due to lack of utilisation with other CCGTs in all EU countries operating at low utilisation levels⁸

IGU believes that EU and member state policies in a number of areas are not effective enough - to the overall policy aims of a low-cost, low-carbon economy. The EC have acknowledged that the EU’s Emissions Trading System is not having the desired effect of encouraging the most use of the most cost-efficient and low carbon technologies available. The current low traded price of carbon that pertains due to the surplus of credits is enabling highly polluting coal/lignite to displace Natural Gas from the Power Generation mix. **These plants emit in the range of 170% to 340% of the CO₂ [tonnage equivalent] of the equivalent Gas fired CCGT plant.**⁹

IGU’s view is that the poorly functioning ETS market is being worsened by the provision of subsidies not sufficiently reduced and re-scaled in accordance with the maturity of RES technologies. This is leading to a suboptimal achievement of a low-cost, low-carbon economy, and this subsidisation has increased energy prices and reduced EU competitiveness with respect to other regions and markets. A technology independent, single approach to CO₂ reduction based on market economics, backed by a properly functioning ETS will deliver the EU emission reduction targets in the most cost efficient manner. In such an

⁷ European Commission Communication: Clean Power for Transport: A European Alternative fuels strategy, pg. 6

⁸ RWE Supply & Trading 2011, Gersteinwerk power plant

⁹ Gas Naturally, Gas:Cleanest Fossil Fuel” 2012.

environment, all low carbon technology can compete on an equal footing and the case for natural gas will be strong thereby improving investment conditions. The EC Energy 2030 Framework gives the EU a **significant** opportunity to examine and reform the ETS for the benefit of all consumers. **IGU welcomes the focus that the 2030 Framework and associated papers are putting on the functioning of the ETS** but we believe that the proposals may fall short of what will be required to assist in delivering the overall policy objectives of the Framework.

In order to improve the investment climate for future investment for Gas Infrastructure, the returns on existing infrastructure must remain sustainable for investors. If policy makers do not adopt policies that demonstrate to the markets that there is a strong future for natural gas, Transmission System Operators businesses will be, as a result, less attractive, and will see higher borrowing costs into the future the providers of capital price in the potential risk of the financial stranding of pipeline assets as a potential knock-on effect of what is happening to the downstream power stations.

IGU agrees with the view of the EC that market failures are often a barrier to the investment in energy infrastructure, particularly where the benefits of the infrastructure typically occur over a significant period of time as is the case with Natural Gas Transmission. Given that a 'user pays' tariff is generally applied to regulated infrastructure, market players will often not support investment that will increase those tariffs. It therefore falls to policy makers to look to the long-term future and to security of supply on behalf of all market participants and make appropriate decisions in that regard. The EC estimates that significant investment (>€70bn) will be required up to 2020 to facilitate the completion of the internal market for gas and also to deliver significant SoS requirements on a national, regional and European basis.

3. Incentives for New Investments in Regulated Transmission Assets

The ACER Network Code on CAM limits auctions of Capacity at interconnection points to a time horizon of 15 years. This mechanism reduces the certainty for TSOs operating the related assets which are typically depreciated over 40-60 years. If long term capacity contracts are no longer possible, then TSOs will require long term visibility and certainty from policy makers and NRAs. **Stable regulatory commitments and long term visibility for gas and gas infrastructure are key to ensure the sustainability of regulated investments by TSOs.**

In a situation where such conditions do not exist, there are different options to incentivise investments on gas transmission assets while dealing with the risk of future low assets' utilisation. Some of the incentives that could be applied on a case-by-case basis are:

- Shorter depreciation curves
- Premiums (WACC surcharge)
- Early recognition of costs
- Longer regulatory periods
- Stability arrangements
- Cost plus regulation
- Exemptions from efficiency gain requirements

The decision for opt one or other measures should be jointly explored on a case-by-case basis and on a jointly manner by Policy makers, NRAs and TSOs. There should be recognition that the need for gas transportation infrastructure may not alone be driven in all cases by direct market demand. Increasingly the need is also being driven significantly by other criteria such as Market Integration and Security of Supply (SoS) requirements. The benefit of the SoS does not just accrue to the gas industry but to the energy industry (including electricity and renewable sectors) and to society and industry as a whole.

A recognition and implicit underwriting of the long term benefits that existing and future investment in Gas Transmission Infrastructure provide to the EU Energy Market as a whole may mitigate the need to adopt additional incentives for new investments.

4. Future Evolution of Load Factors in Transmission Assets

IGU acknowledges positive benefits that increasing penetration of RES into the energy mix have brought to the EU. In this new scenario, the need for flexibility is increasing while the load factors are decreasing. Variable RES imposes a stress on both the electricity and gas networks which is translated in high fluctuations, the need for flexible infrastructure and low utilisation factors. This situation endangers the investment recovery for TSOs which see lower capacity bookings but higher flexibility requirements potentially necessitating further investment.

Benefits and flexibility provided to European Energy markets and particularly to the RES sector by gas pipeline infrastructure should be recognised by governments and policy makers and remunerated as such.

The increasing penetration of RES, as well as the influx of cheap coal due largely to the changing energy mix in the US, has reduced the load factors of gas fired plant pushing them down the merit order even to the position of peaking plants. In some cases relatively new plant having entered service in 2011 were mothballed in 2013¹⁰.

As the load factors have reduced, so too has the willingness of Natural Gas Shippers to reserve longer term capacity from TSOs. Shippers are increasingly relying on shorter monthly, daily and within-day capacity products which are putting pressure on the recovery of allowed revenues by TSOs. The inevitable result of decreased bookings is increased prices which exacerbate the situation by making gas less competitive. This is a vicious cycle that must be broken – while low network tariffs may encourage flow they are not helpful in achieving cost recovery. This situation benefits commodity traders but discourages investment in the capital intensive infrastructure which facilitates the market. Those with high sunk costs for historic investments are similarly disadvantaged. The Network Code on Tariffs currently being developed based on the Framework Guidelines from ACER confer undue advantage on short term users of Gas Transportation networks to the detriment of customers booking long term capacity on networks. This is a further threat to long term revenue recovery of TSOs.

The short term multipliers as proposed, capped at only 1.5 times the annual reserve prices, will enable increased short term capacity bookings, profiling of bookings and day-ahead booking in a manner that is unacceptable to TSOs as **it substantially shifts significant economic risk between users categories** and gives

¹⁰ https://www.eon.com/content/dam/eon-com/ueber-uns/publications/Facts_and_Figures_2014.pdf

increased room for **free-rider behaviour**¹¹. A balance must be found between long term and short term bookings that are reflective of the benefits and services provided to system users.

In the interest of fairness and cost reflectiveness, the short term multipliers must be revisited and adjusted accordingly to appropriately allocate costs among network users. The pricing of Virtual Reverse Flow (VRF) Capacity at the marginal cost of the service are disadvantaging those system users who are booking other capacity products. Users of VRF get effectively the same benefit as those booking physical capacity while paying substantially less for the service.

5. Summary and Conclusions

Natural gas has a large range of advantages which makes it the fuel of choice for sustainable economic growth in the foreseeable future. It has also many challenges that need to be solved. Displacement of coal with gas fired power plants will reduce CO₂ emissions by 810 million tonnes relative to 1990 levels in Europe.

Whether natural gas is going to have a relevant role in the future EU energy mix or not, depends to a large extent on the gas industry itself. The gas industry must do its best efforts to offer competitive, sustainable, innovative and secure energy to society. To achieve this, the gas infrastructure operators need the understanding and support of policy makers and regulatory authorities.

A long-term capital intensive business such as gas infrastructure will have a bright future only if the right policies and regulations are in place. Only in that case, the gas industry will be able to continue investing and innovating without barriers, uncertainties and delays.

Gas Transmission operators need specific and well-targeted policy and regulatory measures which provide investors with certainty about the recovery of their capital intensive, long-term investments in gas transmission assets. Many options are possible (stronger role for gas in the EU energy mix, strengthening the ETS, investment incentives and risk mitigators, close integration of gas and electricity system, completion of the internal market, compliment with renewables, adaptation of remuneration schemes to low load factors and higher flexibility needs, support for deployment of new/innovative technologies, etc.).

¹¹ Natural Gas Transmission Infrastructure is constructed to meet peak demand and to be available year round and for the long term. The majority of customers at domestic and commercial level utilise the systems on this basis and pay accordingly. "Free rider" behaviour occurs when a Network user does not pay for the continuous availability of the network but rather operate on a "pay as you go" basis where the price paid does not contribute to the long term costs of maintaining the network.

III. Cooperation between IOCs & NOCs

1. Introduction

During the past years, there has been a great debate regarding the relationships between National (Oil) Companies (NOCs) and International (Oil) Companies (IOCs) in the gas sector. Over the past twenty years, NOCs have increased their confidence and competence which has made them be international companies on their own. NOCs have enlarged their activities in order to be able to manage their own country's reserves. In this regard, there is uncertainty on whether International Oil Companies will still remain to have an important role to build partnerships with NOCs.

The relationship between IOCs and NOCs vary by project and by country in particular in view of the country's strategy with regards to its natural gas reserves. As Mr. Malcolm Brinded, Executive Director of Upstream International Royal Shell plc says "NOCs differ widely in their origins, objectives and focus." In light of such evolution and taking into account the characteristics of each country and project on an individual basis, Study Group 3 of PGCB has decided to investigate, based on specific project cases, which are the common key factors of success of joint ventures between IOCs and NOCs and establish best practices for these partnerships.

The projects under are:

- Adriatic Offshore
- Atlantic LNG
- North Stream
- Japan Case Study
- Gladstone LNG

2. Projects

This chapter provides a summary of each project:

- Adriatic Offshore: consists of a series of gas fields situated in the Adriatic sea, operated by INAGip (INA 50% - ENI (AGIP) 50%). INA was a National Oil Company (NOC) but became an International Oil Company (IOC) after its privatisation in 1996. There are currently 9 gas fields which are operated by the Croatian company and its Italian partners in a joint company (INAgip). Currently there are 17 platforms in the exploitation field "in the Adriatic, 16 of them are production platforms and one is a processing platform.
- Atlantic LNG: Atlantic is one of the world's largest producers of Liquefied Natural Gas (LNG). It produces LNG from natural gas delivered from fields in and around Trinidad and Tobago to a four-train liquefaction facility, which is located in Point Fortin, on the southwest coast of Trinidad and Tobago. Atlantic operates and manages four LNG Trains, each owned by a group of members in its own holding Company. Today, the facility's total production capacity is 15 mtpa¹².
- Nord Stream: consists of two off shore gas pipelines in the Baltic Sea from Russia to Germany, each of 1220 km, inner diameter 1153 mm. Its total capacity is 27.5 bcm/year each, total of ~ 55 bcm/year. The ownership is as follows: Gasunie (9%), OAO Gazprom (51%), Wintershall (15.5%),

¹² Atlantic LNG website, <http://www.atlanticlng.com/>

E.ON Global Commodities SE (15.5%), GDF Suez (9%). Regarding the commercial side, the project is subject to take or pay obligations by shipper Gazprom Export, and the total costs of the project is EUR 8.45 bln with a project finance/equity 70/30%

- Japan Case Study: In view of the unprecedented high costs of LNG purchases, Japan is seeking for more flexibility to reduce the gap, through greater penetration of LNG to downstream market. There are around 10 additional LNG receiving terminal plans or proposals in Japan, in addition to around 30 which are already in operation. Additional gas-fired power generation projects which are either proposed, planned or under construction. Stable procurement of LNG is one of the top priorities in the newly installed version of Japan's Basic Energy Plan, including strengthening the ties with procuring countries. In this respect, some of the proposed solutions include North American LNG exports in which some Japanese companies are already involved and made offtake commitments in those which are most advanced.
- Gladstone LNG: this project is an integrated LNG project with coal seam gas extraction from Fairview, Arcadia, Roma, Scotia fields in the Bowen and Surat basin in Queensland, Australia¹³. The project promotor is a joint venture between Santos (30%), PETRONAS (27.5%), Total (27%), and Kogas (15%). The project is expected to come on stream in 2015 with a capacity of 7.2 million metric tons per year (Mt/y).

3. Key Skills of IOCs and Main Drivers of NOCs

National Oil Companies (NOCs): NOCs are organisations that have the largest shares of their value held by their parent governments. Most NOCs have both upstream and downstream business operations and, until recently, their business was focused in their home countries rather than internationally¹⁴.

International Oil Companies (IOCs): The business operations of the IOCs usually cover the full cycle from exploration through production, transport and storage to marketing and sales of refined products. As a result of their scope of business and expanded operations, some international oil companies can also be called integrated oil companies (IOCs).

Added Value of IOCs:

The primary concerns for the IOC's business models are market access, risk aversion, and more effective staff utilisation. In general terms, IOCs are concerned about the decline in reserves of their gas fields. New gas fields are more likely to be found in challenging environments which makes it more difficult for IOCs to recover their investments costs. In this regards, IOCs are normally averse about operating or investing in highly unstable or sensitive regions.

Whereas National Oil Companies are responsible for guaranteeing the good use of the national reserves one may question oneself what are the main reasons for NOCs to look after support elsewhere through partnerships with IOCs.

In the first place, IOCs can provide further skills such as expertise in the management of projects as their main focus is commercial driven as opposed to NOCs which are usually guided by policy initiatives. Furthermore, IOCs provide confidence to the project as their reputation is at risk as they have long experiences in the development of projects. However as NOCs build trust amongst stakeholders, it is likely

¹³ GLNG, 2013. *GLNG Project*. [online]. Available at: <https://www.flickr.com/photos/santosglngproject/>

¹⁴ Al-Fattah, Saud, January 2013, *The role of National and International Oil Companies in the Petroleum Industry*, page 2

that they could ultimately develop projects without entering into partnerships with other companies. As said, NOCs are increasingly getting engaged in international projects, thus widening their know-how and experience. One of the main reasons for involving IOCs in partnerships, is their ability to also bring financial support and credibility. Well established IOCs have built a reputation amongst financial institutions and investors, which makes the latter to likely be more interested in participating in a partnership between a NOC and an IOC rather than investing at the risk of one company only. An IOC still brings valuable funds and access to international debt finance¹⁵.

IOCs also provide a very important role in the negotiation of a project which is the fact that they bring a global view and they provide expertise in other projects in which they have previously developed. Furthermore they are usually the ones carrying the intermediary role in order not to expose NOCs to the market. They have a great experience and very qualified personnel to participate in negotiations.

It is also worth mentioning, that IOCs normally bring the know-how and expertise with regards to the technology, leading to competitiveness in the costs of the project. Moreover they can bring alternatives to projects when the market changes by means of innovation. This has been the case in the latest years in which IOCs have been “forced” to undertake large investments in Research & Development, boost in-house investments and cooperate with companies that are technologically more advanced in order to offer added value vis a vis NOCs.

Drivers of NOCs:

The continued rise of NOCs, accelerated by high oil prices, has been the balance of control over most of the world’s hydrocarbon’s resources shift decisively in their favour. Their ability to access capital, human resources and technical services directly from oil field service companies, and to build in house competencies allows them to operate independently from Investor Owned Companies in most instances.¹⁶

Whereas we have seen that IOC’s main focus is to achieve commercial success of a project in order to ultimately provide return for the investors by investing in capital intensive projects, NOCs provide answers to government requests as they have the largest shares of their value held by their parent governments, which are based on a country’s political objectives. It normally has a clear role in managing the resources of the country by fulfilling at the same time the priorities of the government in power. In this respect there needs to be a balance between the interests of the government (strategic, political) and those of the NOC (Commercial, strategic). Until not very long ago, the businesses of NOCs was more focused in their home countries rather than on international expansions.

NOCs do not only seek for the realization of a project also look after the economic development of their countries as well as the construction of infrastructure and entry into other segments of the value chain. Consequently NOCs pay revenues, taxes and royalties to their parent government to drive the country’s political and social responsibilities.

¹⁵ Ledesma, DAVID., July 2009, *The Changing Relationship between NOCs and IOCs in the LNG Chain*, Oxford, Oxford Institute for Energy Studies

¹⁶ Al-Fattah, Saud, January 2013, *The role of National and International Oil Companies in the Petroleum Industry*

With the entry into the market of increasing IOCs, NOCs are able now to choose amongst a larger variety of IOCs. Some of them have even chosen to select IOCs through a tendering system in order to diversify the portfolio of IOCs in the country as well as to ensure the best economical and technical terms. It is therefore important for the IOC to offer added value with respect to their fellow IOCs.

NOCs also value that IOCs respect the culture of the company. Personal relationships within the partnerships are paramount and reinforce trust in the company. As mentioned by specific project promoters of NordStream, Atlantic LNG and Gladstone LNG, trust was a key characteristic which drove the projects successfully. Furthermore, most NOCs also appreciate the involvement of IOCs in social responsibility programmes.

NOCs ultimately control IOCs investment opportunities as they are in control of the access to the reserves.

In addition, the role of NOCs has experienced a turning point in the last years changing from a pure in country investor to seeking business opportunities elsewhere. There is an identifiable successful model for NOCs, which involves operational independence from government, retention of profits for investment, and a strong focus on technology. International oil companies (IOCs) are being challenged in the downstream sector. NOCs' new refinery operations are well- placed geographically to capture demand growth in developing economies, while OECD refinery operations face falling demand in the long term, at least from their domestic markets. Capacity closures already are taking place, reducing IOC share of this sector worldwide¹⁷. It is clear that the IOCs are seeing that their entry into projects with great potential is limited. It is also true that the national oil companies (NOCs) have developed sufficient financing capacity in order to expand their business in the domestic and international markets, but what is important is not to overlook the fact that both the IOCs and the NOCs are facing a common challenge of great dimensions.¹⁸

¹⁷ Oxford Analytica, 23 February 2010, NOCs Challenge IOCs

¹⁸ Brufau Niubo, ANTONIO., President And CEO, Repsol YPF, *The IOCs And The NOCs In The Modern Energy Context*, International Energy Forum

Figure 19 Main Strategy Drivers for NOCs and IOCs¹⁹

IOCs seek:	NOCs seek:
<ul style="list-style-type: none"> • Access to Reserves • Access to Governments • Access to closed in-country markets are only open to NOCs • Secure Investment subsidies and tax incentives (i.e. a stable and attractive investment, fiscal and legal framework) • Economically competitive projects and economies of scale • Avoiding resource nationalism • Risk sharing • Asset Diversification • Maximum Shareholder value 	<ul style="list-style-type: none"> • Access to downstream markets • Access to technology • Access to skilled personnel • Access to capital and international subsidies • Improved efficiency • Quality investment in their country • Knowledge transfer, employment • Economic development in-country • Meeting and fulfilling government priorities • Sharing risk and reducing the risk level to one acceptable to the government

Figure 20 Main Strategy Drivers for NOCs and IOCs²⁰

4. Main Findings

IOC-NOC partnership is the most common type of coming together to do business together. It can be summarised that in this kind of partnerships NOCs gain benefits from this collaboration by gaining specialised skills, cutting-edge technology and expertise in project management, while sharing risk and accessing technical capabilities that IOCs offer. IOCs in return gain access to NOC's gas resources and investment opportunities.

After having analysed the different project cases, together with existing literature we can conclude that even though the success or failure of a partnership between an IOC and a NOC depends on each individual project and country, there are several common characteristics which can be extracted from all the projects:

- **Trust:**

One of the major characteristics which all project promoters have defined as essential for the project to be successful is trust between partners and trust towards stakeholders. This was one of the factors which was claimed by Atlantic LNG to proceed forward with the project. In order to build trust Nordstream states that the set-up of an international consortium was key in the development of the project.

Personal relationships are also a key factor for the good progress of the projects. The accumulation of actions of a number of people, who take part in the different stages of the project, lead to building

¹⁹ Ledesma, DAVID., July 2009, *The Changing Relationship between NOCs and IOCs in the LNG Chain (p.21)*, Oxford, Oxford Institute for Energy Studies

²⁰ Ledesma, DAVID., July 2009, *The Changing Relationship between NOCs and IOCs in the LNG Chain (p.21)*, Oxford, Oxford Institute for Energy Studies

confidence and trust between the partners. Strong individual relationships are important, especially at CEO level.

It is also paramount to build trust in the company towards stakeholders. IOC-NOC partnerships attract much more foreign direct investment into their energy sectors.²¹ Stakeholders tend to value positively the involvement of IOCs in social responsibility programmes.

- **Finance**

We have already mentioned the differences in interests between IOCs and NOCs. Whereas NOCs mainly seek to fulfil the priorities that have been set by the government, IOC's interests are on the contrary driven by shareholder value, opportunities that will enable the company to grow and optimise returns.

IOCs provide the NOC-IOC partnerships with a better position to attract foreign direct investment. NOCs may therefore be interested in building a partnership with IOCs in order to get finance support and credibility.

According to Nordstream, it was really important to involve a group of investors which provided trust in the project. A group of banks were able to provide project finance.

- **Added value from the IOC**

At this point in time in which NOCs have been acknowledged to be capable, confident and knowledgeable not to depend on IOCs, it is worth noting the added value that IOCs can bring in a NOC-IOC partnership. NOCs are usually more confident working with fellow NOCs, however, IOCs can bring global capabilities that NOCs will not necessarily have, especially with regards to:

1. Technology: IOCs bring expertise in some areas and provide advanced technology. IOCs should seek to develop and deploy technology and help to transfer it to the partner NOC.
2. Widening the customer base; IOCs bring a global view on the business and best practices across all segments of the value chain. IOCs normally operate in more than one segment of the whole value chain, providing the NOC with access to other potential markets or segments of the value chain.
3. Helping to build local skills and business: normally NOCs do not have the expertise and human resources to develop the project on its own which is one of the added values that the IOCs may bring to the project. Furthermore, as NOCs seek not only to create profit on the project but develop other areas of the country further, IOCs should seek to provide their partners NOCs with additional benefits such as bringing valuable experience and jobs to the country (example: LNG plant in Trinidad and Tobago).

It is in the interest of the IOCs to offer something to the NOCs which other IOCs do not have and provide certain capabilities that other fellow IOCs may be lacking.

- **Government Support**

Last but not least, project promoters have claimed that Government support is of utter importance for the successful development of projects.

The Atlantic LNG project claimed that it was fundamental to have the Government of Trinidad and Tobago on board. Government support and encouragement was decisive for the project to go ahead. The

²¹ Brinded, MALCOLM., 23 July 2010, Oxford Energy Seminar, Oxford, *Challenges and Developments in the NOC-IOC relationship*

Government, via its policies conferred a competitive advantage to projects in its country vis-à-vis the policies of competing projects.

5. Conclusion

The current energy landscape has stimulated a shift in the different roles that National Oil Companies and International Oil Companies are playing in the development of new business opportunities. Whereas NOCs have started exploring for new options outside their home countries, the role of IOCs is becoming threatened by the increasing experience of National Oil Companies.

This paper has intended to assess, based on specific project cases, whether there is potential for IOCs and NOCs to build partnerships in participating jointly in new business opportunities.

NOCs have shifted from just being allowed to access their country's hydrocarbon resources to cooperate in different kinds of partnerships. On the other hand, even though IOCs are able to provide their technology know-how, their managerial experience, as well as easier access to financial resources. IOCs and NOCs have different cultures as well as political and commercial drivers. Fundamentally NOCs and IOCs may successfully work together where the NOC is able to, in the first place, incorporate IOC's ability to successfully execute a project; and subsequently absorb this know-how into the NOC's own organisation

It can be concluded that even though it is acknowledged that NOCs and IOCs are driven by different strategic objectives, if the two companies are able to strike for the correct balance, the result will most probably be successful. It is the responsibility of both organisations to recognize each other's strengths and weaknesses and bring the best of its relationship.

This was the case of the projects that we have studied, where all of them agree that the same common denominators made their projects successful: (1) trust among partners, (2) better access to finance, (3) higher reputation and (4) risk sharing .

IV. Measures to Prevent Energy Poverty

1. General Introduction about energy poverty

There is a growing awareness all around the world that the right to energy is to be considered as a fundamental right for human being. Currently around 1,5 billion people do not have access to electricity and more than 2,5 billion people rely on biomass for cooking.

The explicit link between access to energy services and poverty reduction have been already stressed in an Energy paper drafted the United Nations in 2005. It demonstrates the importance of energy access for achieving the Millennium Development Goals (MDGs).

As expressed in the report, “the available energy services fail to meet the needs of the poor”.

The world economic crisis of 2008 and its consequences significantly contributed to increase energy poverty and the number of vulnerable customers, including in developed countries. In most European countries, various kinds of measures were taken to tackle this issue and numerous reports were written on that topic, at European or national level.

The problem of energy poverty is first a question of price to access energy and energy services, price that cannot afford vulnerable customers. In some countries which produce gas, as mentioned in the report 2014 on “Wholesale Gas price Formation” made by IGU PGCB SG2, the price to the final consumer can be regulated through social and political measures (Middle East countries) or fixed below the average price of producing and transporting gas (mainly former Soviet Union, Africa and Venezuela). However, those kind of measures will most probably be reduced in the medium / long term so that price of energy reflects the cost of services.

Indeed, there is also a global consciousness that energy is a precious and not inexhaustible good, and that has to be produced in a sustainable way. Thus, dealing with energy poverty is not only subsidizing energy price or helping vulnerable customers to pay their bills –even though it may be quite necessary-, it also means helping customers to reduce their energy consumption, facilitating their access to renewable energies, substituting cleaner fuels for polluting ones, building local and “energy efficiency” solutions to produce energy locally. The better use of energy is vital for the future of our earth and reduce environmental impacts, it is necessary for struggling against energy poverty right now.

The IGU PGC B SG 3 decided to launch a survey on energy poverty owing to the growing importance of this topic and its links with global economic / individual welfare, and sustainable energy as well. As it is the first IGU survey on that topic, it mainly focuses on the current state of measures implemented at a national level to deal with energy poverty. As already mentioned, a lot of European reports already exist on energy poverty. The aim of this survey, based on a set of questions, is to give a very first insight on the measures and practices developed in other continents.

2. Presentation of the Survey

The scope of this survey is to give an overview, at a country level, of the current status of energy poverty and the measures taken to address this topic. The question of sustainable energy is also part of our reflection, for the vulnerable customers may be concerned by measures to promote sustainable energy.

Therefore a questionnaire was prepared and validated by PCGB SGB-3 members . It was sent to representatives of IGU member states (companies, national gas associations...) worldwide in November 2013. As it was the first questionnaire drawn up on that topic, it was decided to limit the number of questions and focus on some key issues.

The survey raised the following seven questions:

1. Existence, at a country level, of direct or indirect measures to prevent energy poverty and promote sustainable energy for all.

The goal of this question is not only to give a binary answer (yes /no) but also aims to give a global overview of the situation at a national level

2. Type of customers concerned / definition of vulnerable customers

This question aims first to identify which categories of customers are concerned, apart from residential customers who are usually the main beneficiaries of such measures.

The question raises also the problem of the definition of “vulnerable customer” in a given country : which criteria are used, and who is in charge to define them ?

4. Type of energies concerned by those measures.

Since it is a IGU survey, this questionnaire pays particular attention to measures concerning the direct / indirect use of natural gas. However, it seems also useful to give an overview of measures related to other energies (and among them, electricity).

5. Kind of measures implemented

This question deals with the different kind of measures which can be taken towards vulnerable customers.

The reduction of the energy bill for vulnerable customers can be possible by :

- reducing / subsidizing the price of energy (“price effect”), eg implementation of specific low energy tariffs for such vulnerable customers,
- helping them to reduce /control their energy consumption (“volume effect”), eg implementation of measures to increase energy efficiency, such as home insulation / renovation.

In some countries, measures can also be taken to finance or subsidize energy equipments and/or installations (eg : connection to the gas network, special financial conditions to acquire a gas boiler).

Measures can also be implemented to help vulnerable customers to pay their bill and avoid energy cut off especially during winter in temperate countries.

5. Existence of a regulatory / legal framework to implement those measures versus voluntary initiative.

The aim of this question is to determine if those measures in favour of vulnerable customers are mandatory (defined by a country law or energy regulation at a national/local level) , or rely on a voluntary basis (private initiatives from energy companies, non-governmental organizations...).

6. Sources of funding

The question, which is closely linked with the previous one, intends to identify the main contributors for funding the measures to prevent energy poverty : State, energy companies, energy customers ,private funding...).

7. Accuracy and efficiency of those measures

The ambition of this last open question is to provide some qualitative comments on the appraisal of such measures to challenge and help to identify “good practice”.

As at 1 January 2014, PCGB SG-3 received 34 answers to the questionnaire, representing 31 countries. The entire questionnaire is given in annex 1, the countries which have answered in annex 2.

The analysis of the answers given by the participants showed that some questions appeared to be somewhat ambiguous and possibly understood differently. Therefore, this first survey has to be considered as a pilot for the next triennium if it appears to IGU this topic of “energy poverty” needs to be analyzed more thoroughly. In this respect, we do hope that our return on experience about this survey will help to build a more relevant and accurate one in the future.

3. Analysis of the answers: main results about measures to prevent energy poverty

1/ Are in your country specific direct or indirect measures to prevent energy poverty?

Among the countries which answered, a majority (75 %) have implemented measures to prevent energy poverty.

But we have to be careful when interpreting this first rough statistics. For example:

- in some cases, energy poverty issues are tackled through the current social policy without specific measures (for example: Denmark); so the lack of specific measures doesn't always mean a lack of concern about energy poverty
- when specific measures exist, it can mean :
 - One specific measure or a range of measures,
 - Measures dedicated to a specific category of clients (for example handicapped people) or to a larger group (for example household income below a certain level)

Some gas/oil producing countries stress that in their case, the energy tariffs are relatively low compared to international commercial price. So the energy poverty question has not the same importance as in non-producing countries, except for remote areas.

To sum up, it could nevertheless be said that to prevent energy poverty is a source of concern in a large number of countries.

But the analysis of the answers shows how it is complicated to have a linear approach of the energy poverty question; it implies to be combined:

- Producing/non-producing countries dimension

- Social acceptability of the measures
- The geography of the country (size, islands, mountains...): physical access to energy may be impossible or quite difficult
- Financial situation of the country

2-1/ If so, what kind of clients are concerned?

When measures exist, residential customers are always concerned. And obviously, when only current social policy is applied, **residential** customers are also concerned.

For some countries (around 25 % of the answers), some measures are designed **for industrials** and / or **commercials**.

Less common (4 answers), a geographical approach can be used, some measures being designed:

- For non-interconnected / rural / remote areas. In that case, for example: real costs not taken into account (implies cross subsidies), or another energy (easier to transport than gas or electricity) can be promoted (for example LPG),
- or for areas having known a disaster (Japan : payment periods extended)

2-2 & 2-3 / Eligibility criteria?

The **income level and / or the consumption level** are the main criteria used for granting aid (two thirds of the answers)

Others criteria are used:

- Debt level, payment difficulties
- Children
- Handicapped / disabled people
- Elderly people (2 countries)
- Geographical criteria (see above : remote areas ...)

Criteria are mainly defined by the Government; the national regulator and/or the municipalities can also be involved.

In some cases, the supplier is in charge of deciding who is eligible.

3/ If so, what energies are concerned by those measures?

Both gas and electricity in most cases are concerned by these measures (two thirds of the answers)

- Among those G & E cases (around 20 countries), LPG or coal or LFO or heating network or all energy forms are also concerned in 12 countries

Gas alone is concerned in one country, Electricity alone in 1 country, plus LFO in another, LPG alone in 1 country

Probably, these answers deal essentially with energy bill since the analysis of Q4 answers shows that more countries are concerned by the measures related to reduction/control of energy consumption, energy efficiency.

4/ What kind of measures have been implemented

The measures to prevent energy poverty cover a broad range of different types:

- Reduction of energy bill (social tariff, lump sum, subvention, rebates...)

In most countries, these measures deal with residential customers using electricity and /or gas : 20 countries for electricity (66%), 17 for gas, 2 for other energies (LPG, light oil fuel). In fact, they are easier to put in place since supported by a network and the necessity of a subscription.

There is a growing concern regarding the implementation of social energy tariffs, based on the income or the level of consumption of households: existence of « social tariffs » in 11 countries.

Lump sums, subvention, rebates are also a way to help consumers to pay their bills (13 countries concerned).

- Reduction / control of energy consumption (subvention for building renovation and insulation, key meters, advice on energy efficiency ...),

Such measures have been implemented in 75% of the countries which answered to this survey. They generally apply to all customers, and not only vulnerable ones. All kind of energy may be concerned (except concerning key meters).

Energy advice is the most widespread measure (mostly from gas operators).

Subvention for building renovation and insulation, more costly, are noted in 30 % of the countries

Pre-paid meters are mentioned in 4 countries. It can be mentioned that, if this equipment is used and apparently well accepted, for example, in UK or Netherlands, it is not the case in France : French family associations consider shocking to ask vulnerable consumers to pay in advance to access to an essential service.

- Measures to finance / subsidize energy equipment or installation (connection to the grid, in-house equipment, safety device ...) are mentioned by 13 countries (44%).
- Measures to ensure the continuity of supply

N.B. there is a possible misunderstanding in some answers (confusion between « vulnerable » and « protected » customers (eg: hospitals).

Regarding « vulnerable customers » (low income, disable, elderly...), **12 countries (40%)** have implemented specific measures to prevent vulnerable customers from curtailing.

In that field, no gas cut-off for bad debt during winter period (generally November to March) is the most widely used measure.

To be less analytic:

Among these different measures, some belong to a curative approach, essentially reduction of energy bill; others belong to a preventive approach (energy efficiency ...), eventually less easy to put in place: more expensive (subvention), needing time (building renovation)...

Each country organizes its own vector of measures, combining curative and preventive ones, and taking into account its own characteristics and constraints (geography, finances, and social context).

This organization has to be periodically assessed to check if it fits with the current situation ; in France, for example, the draft of the law on energy transition (to be adopted in 2015) intends to replace electricity and gas social tariffs by an energy voucher (concerning all energy).

5/ Are those measures defined by law or energy regulation (mandatory) or rely on a voluntary basis?

In 75 % of the cases (23 countries), these measures are mandatory: They are defined by law and /or energy regulation.

In 3 countries, measures only rely on voluntary initiatives.

Some countries (12) combine both types of measures (mandatory and voluntary ones).

Voluntary measures are principally related to **energy efficiency promotion** (from energy operators) or **financial helps** (from charity funds or Non-Governmental Organizations).

6/ Who finances those measures?

Main sources of funding (multiple choices possible):

1. **Government /State:** 16 countries
2. **Energy operators:** 11 countries
3. **Energy consumers:** 10 countries
4. Taxes: 7 countries
5. NGO and/or charity funds: 6 countries
6. Financial institutions /banks: 2 countries

So, as we know (Q5) that, in most cases, measures are defined by law or regulation, we can assume that Governments are more or less deeply involved either directly, either through operator's obligations (if possible), taxes on energy clients or general taxes.

7/ Efficiency and accuracy of those measures?

Each answer is linked to the type of measures implemented in the country concerned, so we can't really make a synthesis of the various positions expressed.

Nevertheless, some common features appear:

- How to focus on the right target, neither too wide, neither too narrow. Verbatim (examples) :
 - "Some of implemented measures are not efficient because they are implemented too widely, not only towards vulnerable customers"

- “measures to help the poor are well target, but the allowance for pensioners makes no account of income levels”
- “no vulnerable customers category ; every consumer will be helped. It is based on his debt. If his debt is too high and he can’t pay his bills anymore he can be helped by the local social welfare department. (...) it is very effective. Customers who are in serious trouble are helped and it’s a custom made approach”
- “strengthen supporting on low income classes who are not beneficiaries of the basic livelihood support allowance provided by the government” (the energy welfare programs are currently focused on needy people who are beneficiaries of this basic livelihood support allowance)

Issue: the choice of the criteria; the prioritization of the potential recipients

- How to adjust the financing and the number of potential recipients. Verbatim (examples) :
 - « if we apply somehow standard EU definition of energy poverty (% of energy bill compared to annual income), enormous number of people will fall within that category. Governmental budget cannot afford to contribute directly. And in a liberalized market the Government found no way to oblige commercial stakeholders to take the burden on themselves”
 - “Measures are good, but not enough money contributed to allow all customers to pay their bills”

Issue: the choice of the criteria: regarding the amount of help, necessity to be able to anticipate how many people will be concerned

- The necessity to pay attention to the effect of the measures on the competitiveness of the energy operators, or on the competitiveness of the industry in general (if crossed subventions between residential clients and industrial/commercial clients). Verbatim (examples) :
 - “measures should be more rationale and should not decrease competitiveness”
 - “Some of implemented measures are not efficient because they caused that many energy companies doing their business unsuccessfully without sufficient income to invest”
- How to deal not only with gas/electricity energy poverty, but also fuel, coal, wood ...Verbatim (examples) :
 - “Most of these measures are made for energy and gas consumers, not for fuel, coal, wood... So great part of consumers don’t receive any help”
 - “the Government plans to start to “Energy Voucher” which can buy any energy source”

Issue: reflections on energy vouchers, current social policy without specific measures ...

- The readability of the range of the various measures in a country: the complexity or the lack of a good organization hinders the efficiency. Verbatim (example) :
- “Each of these measures have their own procedures, their own criteria, their own interlocutors : people potentially concerned by a measure don’t always realize they can ask the benefit of it”
- “Our country has severe problems in management and public management. There’s a lack of strategic planning and there’s not an efficient distribution of resources”

Issue: coordination, rationalization

- The importance of energy efficiency dimension, of preventive measures. Verbatim (examples):
- “influencing the prevention (housing renovation, information on energy consumption) is more efficient than paying bills for people in needs”
- “There is no specific measure how to help with access to energy to those people who cannot afford to pay. The good job is done in the field of energy efficiency, promoting it and helping with better loans”

Issue: financing; long term versus short term strategy

4. Conclusion

Main features

Energy poverty is a growing concern shared by a majority of countries participant to this survey....

The survey shows that among the 31 countries which answered to the questionnaire, more than 75% had implemented measures to prevent energy poverty. In more than 75% of the countries which have developed such measures, they are made compulsory by law or by regulation, which demonstrates the involvement of public authorities in helping to solve this issue.

...However, one size doesn't fit all

The analysis of the answers shows that energy poverty concern is broadly shared, and a preliminary reaction would be to try to elaborate “best practices” based on the various measures described in these answers. However, we observe that, when they exist, the measures to tackle the poverty energy issue are heterogeneous ; moreover, the lack of specific measures doesn't always mean a lack of help towards vulnerable consumers, if general measures (social security ...) are implemented.

The type of measures and the appreciation of their efficiency are linked to the economic conditions (financial situation) and the « culture » of the country (example : the pre payment meter is completely accepted in some countries and rejected in others) : each country tailors a range of measures in line with usual social policies of the country. Taking into account this point, heterogeneity is not surprising.

But as a consequence, it's rather difficult to really benchmark practices and elaborate « best practices » :*“one size doesn't fit all”*.

Tackling with energy poverty is not only a question of energy price

Even though the growing implementation of social tariffs at national level applied to specific categories of vulnerable customers is to be noticed, it has also to be pointed out that the scope of measures is much broader.

Reducing energy poverty means also replacing polluting fuels for heating or cooking by natural gas which is a clean energy and therefore improving also individual comfort, health and well-being. It also means facilitating access to energy by developing specific measures to connect new customers to the gas network. Last but not least, energy poverty measures aim also to help vulnerable customers to consume better and less, by giving them access to energy efficient solutions.

The most efficient way to reduce energy poverty is definitely to anticipate, as much as possible, the implantation of preventive measures rather than developing curative measures.

Next steps / recommendations :

This survey on energy poverty was the first one conducted by IGU with the objective to cover not only developed countries and especially the European countries , but also other continents and all countries members of IGU.

As we think that this concern on energy poverty will become even more important in the coming years, we would suggest to consider this first report as a draft starting point and to elaborate a new survey for the next triennium, taking in account the experience learnt from this first one. The main improvements to be envisaged could result in :

- a better formulation of some questions in order to avoid misunderstandings,
- a restriction of the scope of the survey to residential customers
- a better coverage of countries involved in this survey, European countries' participation remaining over represented,
- a deeper analysis of the efficiency of the measures undertaken to deal with energy policy,
- an identification of the main trends / changes occurred to tackle energy poverty since the previous triennium ("dynamic analysis").

Necessity to focus on the most value added fields of questions

The list of countries (annex 2) shows that European countries are well represented ; the question of energy poverty is generally tackled in Europe, each country with its own approach, through specific measures or through a general social policy.

This point is related to the fact the European Union directives on gas and electricity internal market require to take into account vulnerable consumers.

A lot of reports exists on European situation, including description of measures in different countries.

For example :

- Reflections of the Citizen' energy (London) Forum ; Vulnerable consumer working group guidance document (November 2013)
- Opinions of the European Economic and Social Committee (for example : opinion "for coordinated European measures to prevent and combat energy poverty" September 2013)
- Report of the French Observatory on energy poverty (September 2014)
- Energy poverty in Belgium (December 2011 ; Université libre de Bruxelles, Université Antwerpen)

These two last documents include benchmark on some others european countries

It seems to us that, if IGU wants to go further on energy poverty question, it would be more valuable to focus its efforts on other parts of the world than Europe.

- South America
- USA
- Asia
- Australia

Producing countries need a specific approach to check how they drive the evolution of their prices to the final consumers.

Focus on residential vulnerable consumers needs, with both curative and preventive (energy efficiency) dimensions

The answers dealing with industrial or commercial consumers don't bring really valuable information: it seems to us more valuable to focus on residential consumers, on the efficiency of the measures and to explore how curative and preventive measures could be articulate in a better way.

Don't stay on a static point of view

By definition the answers we received are a photography of the situation at a certain moment ; the growing concern about energy poverty and the feedback about the measures put in place, the budget difficulties of some countries imply to be cautious about the evolution of the policy, and sometimes a stop and go policy. For example,

- in France, it could be provided by the law dealing with energy transition (March 2015 : still in debate) that the social gas and electricity tariffs are replaced by an "energy voucher", applying for any energy (gas, electricity, light fuel oil ...)
- increasing electricity tariffs, according to the level of consumption, were announced in January 2014, to be put in place in 2015 in Belgium. Six months later, these tariffs were considered too complex to be implemented.

ANNEX I

Survey on energy poverty and sustainable energy for all

Could you please fill out the following questionnaire and return it to mailto:
claire.ancelin@gdfsuez.com and herve.delain@grdf.fr until the 30th of November 2013.

(Thank you for filling out this survey in black, leaving the questions in blue)

 **COUNTRY :**

 Name of the person who fills this questionnaire :

 Mail address in case we have questions :

 Name of the company /gas association :

(those contact details won't be used in the management of the answers, but are useful for us if we have additional questions to ask to you)

- N.B. 1 : the main topic of this survey is energy poverty, but the question of the sustainable energy is also part of our reflexion, for the vulnerable customers may be concerned by measures to promote sustainable energy.
- N.B. 2 : the last question (n°7) on accuracy is especially important for our reflexion on the energy poverty, to challenge existing measures

1/ Are in your country specific direct or indirect measures to prevent energy poverty and promote sustainable energy for all ? Please give here a global overview of the situation, before answering the following more detailed questions.

2/ If so, what kind of clients are concerned ?

- Which categories of customers
 - Residential :
 - Industrial :
 - Commercial :
 - Others to be précised :
- What eligibility criteria are used to identify those customers ?
 - Income level/consumption level :
 - Others to be précised :
- Who is in charge to define and apply those criteria ?
- Comments :

3/ If so, what energies are concerned by those measures :

- Natural Gas :
- LPG :
- Electricity :
- Heating network :
- Coal :
- Light Fuel Oil :
- Wood :
- Others to be précised :
- Comments :

For the following questions please indicate which energy(ies) are concerned :

4/ What kind of measures have been implemented ?

- Measures to reduce the price of energy
 - o Implementation of social tariffs :
 - o Rebate on customer bills :
 - o Lump sum :
 - o Subvention to help vulnerable customers to pay their invoice or their debt energy :
 - o Others to be précised :
 - o Comments :
- Measures to reduce and/or control the energy consumption
 - o Subvention for building renovation and/or thermal insulation :
 - o Installation of key meters :
 - o Installation of remote reading meters :
 - o Advise and advocacy on energy efficiency, and consumption control :
 - o Technical measures to limit energy consumption :
 - o Others to be précised :
 - o Comments :
- Measures to finance or to subsidize energy equipments and/or installation
 - o Connection to the energy grid :
 - o In-house equipment :
 - o Safety device :
 - o Others to be précised :
 - o Comments :
- Measures to ensure the continuity of supply
 - o Are in your country specific measures to prevent vulnerable customers from gas cutting (e.g. during winter period) ?

5/ Are those measures defined by law or energy regulation (mandatory), or rely on a voluntary basis ?

6/ Who finances those measures ?

- Governmental bodies :
- Taxes :
- Non governmental organizations or associations :
- Financial institutions and/or banks :
- Charity funds :
- Energy operators :
- Energy consumers :
- Others to be précised :
- Comments :

7/ What is your personal feeling on the accuracy and the efficiency of those measures ?

- ➔ This question is especially important for our reflexion on the energy poverty, to challenge existing measures.

THANKS A LOT FOR YOUR KIND CONTRIBUTION TO THIS IGU SURVEY !

ANNEX II

Countries which have answered (including a “no specific measures” answer or a very short answer)

34 answers representative of 31 countries:

Europe : Austria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Ireland, Italy, Norway, Netherlands, Poland, Portugal, Slovakia, Spain, United Kingdom

Africa: Algeria, Tunisia

Asia / Oceania: Australia, China, Japan, Korea, Malaysia, Pakistan, Thailand, Turkey

America: Argentina, Brazil, USA, Colombia, Peru

ANNEX III

Presentations of partnerships between IOCs & NOCs

1. Challenges and Opportunities for Japanese players in the Globalizing LNG Market
2. Nord Stream, status
3. Croatia – Adriatic Offshore
4. Gladstone LNG
5. Atlantic LNG Case Study

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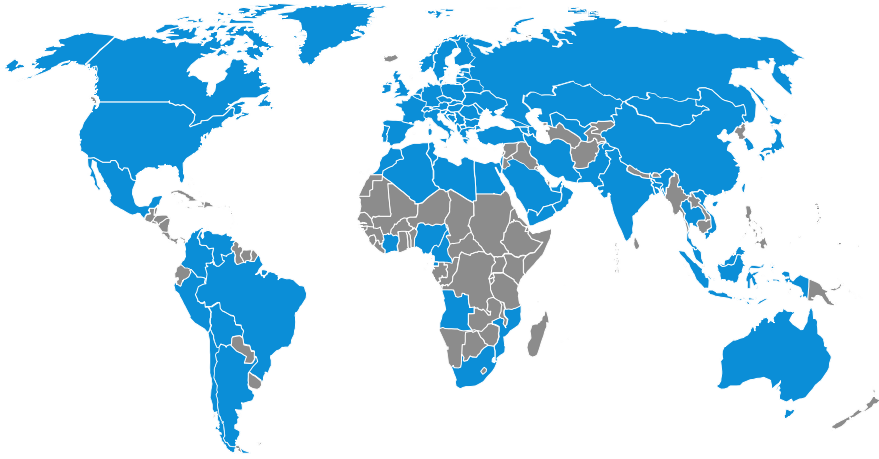
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