

That elusive cost reflectivity

*Story of a business trip*¹

Part 1: Some regulatory price discrimination problems

Towards the end of 2012, the Agency for the Coordination of Energy Regulator (ACER) was about to finalise the Framework Guidelines that would have driven the drafting of the European Network Code on tariff structures for gas transmission. Therefore, ACER had summoned the gas industry and all interested stakeholders to a European capital for a public workshop on the topic.

Tariffs had hardly been a topic of much relevance at European level so far. Regulators were used to define them for their own country. On the other hand many shippers were already busy enough to obtain at least some of the capacity they needed, so they could hardly be choosy about the prices they were paying. Those shippers who were transporting gas across several systems had mostly been doing so for decades by means of long term contracts for remote imports and were quite familiar with them. The few new ones had often to deal with tariffs that were expressed in different units, for different capacity products, changed at different times, calculated in some way that was hardly understandable as it was often only explained in some mysterious language, if any. In such cases they often managed by hiring a local consultant who understood the language and could tell them in basic English how much of their margins they had to leave to the operator of the transit country.

But by end 2012 the draft capacity allocation network code had been published, though not yet approved, and as such had already done a good job in harmonising the capacity products and providing some agreed way to get them; therefore it was now both feasible and interesting to compare the prices. In principle the prices had to be defined by auctions, however everybody in the industry knew that in most cases some capacity was available, and - as the British case had already shown – auctions were not often going to be much crowded. Therefore regulated tariffs were going to matter, as they were supposed to be normally used as reserve prices for the auctions.

Jenny, a young economist working at the energy National Regulatory Authority of a large European country, was mumbling on such issues when the invitation to the Workshop appeared in the stream of emails on her PC screen. She immediately forwarded it to her boss and to the Administration for the necessary authorisations, of course she had to attend that workshop! That was the time when the real decisions were taken, she thought, as later the fundamental pillars of the new code would have been defined and could hardly be modified. Moreover, despite her limited experience, Jenny had quickly learned that the last minute changes that were forced on the texts – usually by higher level people, NRA Board Members, or even the Ministerial Sherpas who run the Comitology process, were often worse than the mistakes they were meant to fix. She had to be in the thing now.

Her boss was very understanding and immediately agreed, but those guys in the back office were always so slow in accepting trip requests. They almost never travelled, let alone abroad, and some of them certainly believed that all such trips amounted to some sort of hidden tourism. They hardly

1 By Sergio Ascari, Gas Adviser, Florence School of Regulation. This short story is aimed to provide some theoretical context and help thinking about issues that are at the core of tariff structure determination. Michelle Hallack, Miguel Vazquez and the members and observers of the ACER Gas Tariff Expert group helped me to develop these ideas, however any responsibility is with the author only.

Use of English names in this paper relates to the language of the text, not that of the characters, who are not necessarily native English speakers, and are anyway entirely fictitious and by no means inspired to real persons or countries. Any resemblance is purely coincidental.

understood how the power and gas industries were getting so international. And governments were cutting all regulators' expenses, because of the financial crisis, so they had another point to double their enquiries, filing requests for written mission motivations, including an assessment of the impact of going or not going to each and any meeting or workshop.

At the end the permit came, and Jenny had her flights booked. On the workshop day she caught a train to the airport, that meant waking up even earlier than the five thirty usually needed for that flight, but that was cheaper than a taxi and the back office was happier. She had given her little contribution to preserve the ailing national public finances.

When the train was about to leave, she saw a man with a long, wild beard and a dirty jumper who looked like one of those tramps who are at odds with the rules of the civilised world. He was shouting at the conductor, who had apparently just caught and thrown him out.

“Why don't you allow me in Mister?”

“Because you have no ticket, Sir” replied the conductor, repressing the other word he would have most happily used with such interlocutor.

“But the ticket is so expensive, your company is exploiting the people - replied the man – what's the cost of taking one more passenger on this train? That's almost nothing, maybe a millionth of the energy that's being burnt by the engines anyway. I would be ready to pay that money. And this f..... route to the airport is so dear, it is priced at twice the rate of other train routes, I know the distance! You are reducing the social welfare by preventing me to use this service at a price in line with the marginal cost, and you are abusing your monopoly power by charging arbitrarily high prices for it!”.

The conductor was about to reply that he was just enforcing the rules and that Mr. Passenger should have complained to the company customer service, but the automatic doors were shut and the train left. Or maybe he could complain to the regulator, thought Jenny, but was there a regulator in railways? Well, probably a weak one, she thought, if the tramp was right and such discriminations were being allowed. Not that she was eager to share the trip with such person – from his look she could guess that he wasn't very familiar with soap and showers; but he may have had some points after all.

Jenny opened her business case and picked some photocopies. She had read carefully all the documents for the meetings, including the draft Impact Assessment and the Consultant's study, and kept thinking about cost allocation issues that were mentioned in them. Yet she felt that some important issue was missing from the debate. From her studies she vaguely remembered a story about cost allocation called “the Calais traveller”, that had been worked out by a famous French economist, a Nobel prize winner, Maurice Allais. She hadn't managed to retrieve it from her books, so she just googled the sentence and found the story in a wikipedia item. That had been probably translated from French by an automatic translator, because Maurice Allais had become Maurice Went, and the text was a bit clumsy, but understandable. It was probably a summary rather than Allais' original story. Jenny read:

“Maurice Went asked the question of knowing 'how much costs a passenger assembled in the train for Calais?’

- A *controller* will estimate that the consumption of additional resources is not really calculable, and will be tempted to answer *almost nothing*;

- A *conductor* will measure more: if sixty passengers make like him, it is necessary to add a car to the train. It will thus be tempted to charge 1/60^{ème} cost of the car during the time of transport;
- The *chief of line* does not hear it: one cannot indefinitely add cars to a train, and for 20 cars it is necessary to double this one. It thus wishes to charge for its part, in more of the 1/60^{ème} of the previous car, 1/1200^{ème} of the price of the motor coach and the wages of its driver;
- The *chief of network* does not agree at all: one cannot thus multiply the trains without risk on the same way, and starting from 50 trains per day it is obliged to double the way. It thus adds for its part 1/120 000^{ème} cost of the way (always paid to the time of transport).

Maurice Went noticed as by successive approximations one arrives so that must be the minimal cost of the ticket so that the railway company is never found in a dead end. This example is associated to him under the name of metaphor of *traveller of Calais*, which illustrates that one can never speak to be strictly accurate about *cost of a good* or of a service, but which it is more exact to speak about *cost of a decision* while indicating to which level one considers it.”

After deciphering that strange French-English story Jenny felt a little relieved, and felt less guilty about the guy who had been thrown out of the train. At the same time, she noticed how relevant this point was about the claims of those people who said that gas transmission capacity should be priced at zero in the short term (or possibly just at the variable cost of gas transmission, that is fuel gas and losses, which is quite low). Those people were often raising the point that capacity was already there, and paid for, so that it was inefficient not to use that capacity if somebody was ready to pay the variable cost of transporting one more unit. Who said that? Some colleagues who were more familiar with electricity than with gas, who claimed that transmission costs should just be charged to end customers rather than to network users – they claimed that at the end of the pipe end customers pay for everything, if they pay for transmission straight away that would simplify things and boost trading. Of course several traders shared that view, especially those new spot market operators who were so keen at finding arbitrage opportunities and did not like to be bothered by transmission costs.

Thus, Jenny reasoned that this view was consistent with the tramp's and with Allais' controller, but not with those in charge of the line and network. On the other hand, if end users were charged for network costs, shippers would not really choose the best way to carry the gas. She somehow understood the electricity colleagues' perspective: they were always desperately tracking those crazy electrons that were swirling across the continent networks at the speed of light with little respect of national and system borders. On the other hand her gas molecules seemed much more domesticated, she – or more precisely: the operator's engineers - generally knew where the molecules were going – and could track the costs as well, presumably.

Even if several shippers' gas was mixing she knew that not all routes were the same and that if she could know the shippers knew too. One of her tasks as regulator was to achieve the greatest transmission efficiency, and somebody must choose the cheapest transmission ways at some point of the decision process. Could the end customers choose? Certainly they don't even figure out where the gas comes from, at best they could choose indirectly by preferring the suppliers who had used the cheapest way, all other things being equal. Could regulators choose then? She intimately smiled at being in charge of such decisions, but she knew that even her best technical colleagues were just too few and knew too little to decide the gas routing among the existing paths, or whether a new line or a reinforcement was needed. Sure, some cost benefit analysis could be undertaken, but she knew that it could give only a partial contribution, featuring lots of uncertainties where political pressures could step in. And she shivered at the thought of the political pressures for laying or not

laying those pipelines – or the LNG terminals, even worse! No, that had to be decided by market participants, looking at costs and deciding which way, how and when buy the capacity on the available routes. True, in some cases transmission companies had meshed networks, the decision on the actual routes could be a technical one, but there are many systems and operators in Europe, and shippers could be made to choose between them, and in a few cases even among routes run by the same Transmission System Operator. Of course there are other objectives, not just efficiency, for example security of supply, where public powers had to be involved: but they could just be part of the picture, adding their money to that of the shippers.

Jenny was now happier as the picture looked brighter. In turn, the TSOs could react to that demand, as in any market, and would allocate their costs – all costs – to the users. After all everybody now seemed to agree on the principle that a transmission capacity market was useful – were they not going to set up a system of capacity auctions? The principle looked clear, and broadly agreed. However there was that problem, that not always the auctions were expected to actually decide the prices, as many expected a lot of overcapacity in several interconnections. Therefore the regulated tariffs became important again, and to make them costs had to be allocated.

Yes, but how? Meanwhile, thinking that Allais had not really explained how to allocate those costs, Jenny had arrived at the airport, left the train and walked to the gate with her boarding pass in her hand, already printed back in the office. The authority's administration had lately implemented a procedure to select the cheapest travel route (same problem as for gas, Jenny thought), and that almost invariably led to the choice of a low cost airline, where you had to rush for free seating alongside teenagers excited by their maiden flights and barely checked by hardly older flight attendants who looked like the characters of an MTV serial. Well, considering the financial crisis you could be happy to be allowed to travel, concluded Jenny with a half smile.

Suddenly her meditative mood was hit as a familiar voice gently called her name. She turned back to see Teddy, a former colleague from her first job, when they still both worked at the former incumbent gas supplier in their country. Now Teddy, was with a gas trader and sometimes used their old acquaintance to raise his points, a customary lobbyists' job. As she greeted him she felt happier as she liked his company, and of course it was better to have somebody with whom to share the resistance against the new flying teenagers' assault. At the same time she quickly prepared herself to strengthen her mental walls against the subtle points she knew he would certainly raise on some hot issues. However this time she felt confident and galvanised by what she had just been reading about short term capacity costs, an issue that Teddy was always raising in their professional discussions.

After those thoughts and as they were starting to exchange the usual job & weather & family short reports, she also realised how surprising was to find Teddy on that same cheap flight. After all Jenny knew that he liked a more expensive life than hers, it was not to crunch his long legs into low cost airline seats that he had joined a trading company. Thus, she asked him how he liked that airline.

“I love it - he answered - it always hosts young and joyful people, and it's so cheap! I'm paying ninety Euros return for this flight, that's wonderful; I remember that it was about four hundreds when I went there with my parents, some twenty years ago! Our company is very cost-aware, they always look for the cheap fares, at least for short flights, and after all even such seats are acceptable for just an hour long flight”. He was now taking his middle set, leaving Jenny on the more comfortable one on the aisle side.

Jenny's feelings changed briskly. “Ninety? I'am paying two-hundred and fifty, and I am getting exactly the same service as you! That's discriminatory!”, she yelled.

“That's weird, when did you book?”

“Well, I think that my back office bought the ticket at the end of last week”.

“That must be the point, I booked a month ago. Didn't you get the invitation then?”

“Yes, and I forwarded it straight to the admin people, but you know the public sector red tape, it takes time to get all the permits. But I don't think that this justifies such a price difference. After all the service cost is just about the same, whether you buy the ticket one or four weeks in advance”.

Jenny was now furious, as she had kept a sort of youth enthusiasm for her job, she always wanted to see efficiency everywhere, and especially hated the waste of public money; but she was now actually cross subsidising a private sector speculator, and possibly all those noisy teens seating around them as well.

Teddy did not want to see her so upset. He carefully managed to switch the topic to something more relaxing, asked what he could buy in their destination city to bring back home to his children. Jenny was helpful on shopping, she had been in that city already, and was happy to provide some advice. They safely and softly landed and headed for a taxi to the workshop venue in the city centre, which they were obviously going to share.

Yet, cost allocation issues were in the back of Jenny's mind. When they started their taxi ride Jenny noticed that the taximeter price had started from a fixed charge of five Euros – slightly less than the six twenty she used to pay at home. She asked her friend:

“Teddy, do you think that this taxi fare is cost reflective?”

“What do you mean? It's a regulated price, isn't it?”, he laughed.

“Yes, but I am not questioning the price level; I assume that overall tariffs cover taxi costs, including a fair profit. What I wonder is whether the tariff structure is cost-reflective. Fixed charges should cover fixed costs, and variable charges should reflect variable costs, shouldn't they? Now I guess that if we are going to pay about thirty Euros - I've been here already, I know the price more or less – if we pay thirty the fixed charge of five would be one sixth of the total; but I would expect that the fixed part of a taxi ride costs is much higher, and the distance – related part should be smaller.”

“Of course you're right”. Teddy had tried to quickly compute the fuel cost of their ride, and found that it was probably not more than three Euros. “Would you include the driver's pay in the variable cost?”

“Probably not. In fact the driver works even if he's just waiting for clients, therefore he's a basically fixed cost. But I guess that even if I did, variable costs would be far less than nearly eighty three percent of the total, and certainly not one Euro per kilometre as we are paying here”.

“Or even back home”, Teddy agreed. “For what I can see taxi fares are a bit lower here, but the ratio between fixed and variable is not very different”.

“OK, they may be similar to ours, but the problem remains”, rejoined Jenny. “If the tariff is not cost-reflective, there are cross-subsidies. For example, with such tariffs where the distance-related component is higher than the variable cost, people who take longer rides – like us, as an airport ride is probably longer than the average city taxi ride – are cross-subsidizing passengers that take shorter rides.”

“Well, don't worry too much Jenny”, said Teddy who again did not want to see his “regulator”

associate him with unpleasant feelings, “after all my company will pay our ride, if you don't mind and don't see it as a bribe!”, and laughed.

Jenny accepted under the promise that she would pay for the return. Soon they arrived at the Workshop venue. A welcome coffee was being served. Over a hundred representatives of transmission system operators, large power, oil and gas companies, distributors, regulators, and their umbrella organisation were already crowding the place. Everybody was greeting friends, some commenting on the last ACER draft. Jenny immediately noticed a tall, aged man with a dark suit who was drinking his coffee on its own at a corner of the room. She whispered into Teddy's ear:

“Do you know that guy Teddy? That one in the corner”.

Teddy slowly turned to peep at the man she meant, and replied “I think I've seen him, but I can't remember his name”.

“So do I. We were actually introduced but after that somebody said that he always looks so gloomy and they started to laugh and call him Mr. Gloomy, so I remember that nickname but not his real name”.

“I guess you can't approach him as Mr. Gloomy”.

Jenny chuckled: “Not really... but look! Here's Bobby! How are you?”

Another former colleague was now in front of them, kissing her and patting Teddy's shoulders. When the former incumbent in their country had seen its market share shrinking after the liberalisation, they were among many staff that had looked for better perspectives. Bobby had chosen a large power utility where he was now in charge of natural gas procurement. And of course they were often meeting at public gas industry events at home or abroad.

Bobby told his former colleagues that he was fine, but a bit upset by what he had seen that morning upon arriving in the city. He explained that he had arrived earlier than them (power utilities must still send around their staff by scheduled airlines rather than low cost, thought Jenny) and been walking in the neighbourhoods. At some point he had glimpsed a car in a shop window that was exactly like his brand new one! Even the same colour! But what had annoyed him was the price tag that lay by the car: that was ten percent cheaper than the price he had paid back home.

“Why are you surprised Bobby? This is a less affluent country than ours, most things are cheaper. Why shouldn't cars be cheaper as well?” asked Teddy.

“Why am I surprised? Do you know that those cars are made just in our country? The factory is fifty Km from my home. The transport costs to this country must be something after all, how can the same car cost less here? I think that we are subsidizing this country's customers, and possibly not for cars only”. Bobby was in a bad mood as he entered the workshop hall. He thought “Let's not get fooled with gas tariffs at least!”.

Part 2: Some unrepentant economist's views

The Workshop went on smoothly. Representative of ACER, stakeholder umbrella organisations, and an appointed consultant delivered their presentations. Somebody raised questions or made comments. The Chairman called for a few votes on selected issues he had carefully prepared to assess the opinions of the audience. The European Commission representatives took due note. Mr. Gloomy sat silently on an aisle seat in the last line, possibly planning to leave swiftly after the

event.

Had he had such plan, it did not work that time. At the end of the workshop, while everybody was leaving he saw a smiling Jenny in front of him. “Good evening, Jenny, how are you?” and after few preliminary greetings, with Jenny desperately trying to avoid having to address him by his name, they were heading for the exit.

“How do you like this process?” asked the man.

“Well, it seems to be proceeding smoothly, but there's something I don't understand in the whole thing. I thought I would be interested in your opinion... if you aren't in a hurry?”

“What about?”

“Something more basic than the Framework Guidelines' details, actually. You see, this whole discussion about tariff structures is related to avoiding discrimination between system users, ensuring cost-reflectivity, and minimising cross-subsidies. We regulators all agree on these objectives, even though there are some differences about how to achieve them – as you heard today. Most other stakeholders also broadly share such goals. However, I was looking at several industries (other than gas) from this perspective when I was travelling here this morning, and it seems that the whole world is full of discriminations and cross-subsidies and that prices usually lack cost-reflectivity. I was discussing with some friends today, and that seems to apply to very different industries, whether they are regulated or not. For example, airlines discriminate, charging different prices to customers with little reference to costs. Taxis – and that's a regulated industry – cross subsidise short rides by long ones, as their tariff structures has a variable – in fact, a distance related component – that is much higher than the variable cost. Airport rides seem to be more expensive everywhere, whether by taxi, train or bus. In this country, car buyers are cross-subsidised by those of other countries like mine, as another friend has found. Is that just a random occurrence of poor regulation of inefficient markets? Or are we missing something?” she kept telling about what she and her friends had found that very morning.

“Interesting questions Jenny, indeed. But answers may not be that short. Are you rushing to the airport?”

“No, I have a little spare time. What do you suggest?”

“It's rather warm for such season isn't it? What about a little stroll in that park?” he pointed across the street at the red autumn trees still shining in the declining sun.

“Yeah, this must be global warming... let's take the best of it and have a little walk over there”.

They crossed the street and entered the park. The man started to speak with a uniform voice as he slowly proceeded back and forth along the alleys with his hands in the pockets of his long, unfashionable overcoat.

“Let's start from some basic point. You may remember from your studies that a competitive economy is expected to drive prices in line with long run marginal costs, and that those marginal costs should be also very close to full – or average - costs, which are their practical cost equivalent, as calculated by accountants. This is certainly true for most industries, but there is an important caveat. In fact, many goods or services are produced *jointly*. I mean that some production factors – or some parts of their value chain, if you prefer a managerial or accounting perspective – are shared by several products, or simply by the same products sold at different times or in different locations.

In fact, the accountant is a bit embarrassed in such cases: you know that well, because regulators are often in charge of enforcing accounting guidelines.”

He paused to see Jenny nodding approvingly, and continued:

“When the accountant finds a cost that cannot be clearly allocated to a product or production line, he just splits it by mean of a cost driver, so that a *fair* cost allocation is ensured. However the selling company has the opportunity to charge the joint costs unevenly. And in fact sellers do just that: they price the goods according to what the marketing managers suggest – not as the accountant has charged. If necessary, where no official accounting guidelines forbid it, they instruct the accountants to use an appropriate cost driver. In any case, it’s the marketing manager who decides how to actually cover the costs of joint production factors, not the accountant. For example, take a food shop that sells meat and fish: even though the production lines are totally different, at least some logistics and distribution costs are shared, and the shop can charge such costs even on a single item, let’s say fish, if it feels that the market can bear a higher price. In principle, if the joint cost can be avoided, a competitor could beat him and impede the cross-subsidy: he could sell fish only and charge the right logistics cost, without the cross-subsidies for the meat buyers, but in practice that is not the case, as nowadays most food shops are large supermarkets that always sell both meat and fish - and countless other items of course. The sellers of “separate” fish or meat cater to a niche market, they only sell higher quality products; therefore their action cannot really avoid the cross-subsidies. In practice, all shops will adjust prices according to market demand, following economic laws that you may know. I’ll come back to them later.”

“Which laws do you mean?”, asked Jenny.

“The laws of demand elasticity. If someone has to recover a certain amount of money – the cost of a public good, or that of a common network – the best way is to price the relevant products in inverse relation to demand elasticity. It’s an old rule – it’s known as Ramsey’s rule, dating back to the 1920s – but it has been confirmed by more recent research. You can find it even in general advanced microeconomics textbooks, for example you could see the classical Varian’s Microeconomic Analysis, which has a section on optimal pricing. It may be applied not only to strictly different products, but also to the same product sold to different customers, or at different times.”

“But that sounds like price discrimination!”

“It is, if you believe that the only correct way of allocating costs is the regulatory accounting principles. But you have a point: before we further discuss price discrimination we should agree on what we mean by it. There is a seminal book by Louis Phlips on the economics of price discrimination. Of course discrimination does not necessarily mean that customers pay different prices. On the contrary, if they are served at different times or location and pay the same prices they probably cause different costs, and that is also discrimination. In general, as a matter of definition, discrimination occurs when price differences are not in line with cost differences, as defined by the accountant - for example an accountant who follows the regulatory guidelines. Do you agree?”

“Yes”.

“Now, what Phlips showed was that price discrimination is not necessarily inefficient. In fact, a monopoly is normally inefficient – as it increases prices and restricts sales but a *discriminating* monopoly is less inefficient, as it tends to raise prices only to those who can pay more, whereas it charges lower prices to those who cannot. As a result, a larger output is actually produced and sold, and the outcome is closer to that of perfect competition. However, all margins - or surpluses, as economists often call them - are taken by the seller, and of course we may not like that. Sometimes

such policy was used by former state monopolists, including in gas: governments fostered such policies, for example in some cases they allowed discriminatory pricing by gas companies, with a view to cross-subsidise the growth of the gas industry in trailing consuming sectors or areas, or achieving economies of scale that were needed for the feasibility of ambitious supply projects; or simply to replenish public coffers. It may also be argued that this is a sounder and more efficient policy than many forms of taxation, and the early history of the gas industry is full of such examples.”

“I know that this happened in the past, but that time has long gone. Are you saying that we should go back to state monopolies?”

“Not at all. However let me notice that the problem with such monopolies was not so much with their pricing practices but with the lack of cost saving and innovation incentives they had. Economists say that such monopolies lacked dynamic efficiency, not static efficiency; and in fact the efforts of regulators in the last twenty years have been largely devoted to providing incentives to boost efficiency over time. Much recent theoretical regulatory economics has covered such topics too. However various forms of price discriminations are widely practised, as you found in your business trip. A typical tool is two-part tariffs, with components not in line with the cost structure. Take the taxi example: here the cab and its driver are joint production factors for both (say) long and short rides. But, they know that people who hire taxis for longer rides (to go to airports or to other far destinations) are ready to pay more. Therefore they charge fixed charges that are below fixed costs, and in this way cross-subsidise shorter rides that would not occur otherwise. Could you imagine what somebody calls a cost-reflective tariff structure for taxis? With a fixed charge of fifteen Euros or even more? Few people would use them.”

“Sure” replied Jenny. “However I thought that the reason most costs are covered by variable components is that ultimately all costs are variable. After all, taxi drivers or companies can adjust their supply in line with demand.”

“Yes, but not entirely. First, demand is actually swinging, like that for power or gas – there is much less demand in the middle of the night than in the morning rush hours, hence some capacity will stay idle anyway, however effectively you are organizing your supply. Second, demand is always somehow unpredictable; therefore you need some reserve capacity anyway. And last but not least, taxis are actually competing with other transport means, like buses, trains, or private cars. Taxi companies know that and adjust their prices accordingly, so that they can compete more effectively even if that entail some cross subsidies between their customers. Regulators of such industries are not necessarily weak if they allow such practices: they know that in this way the fixed capacity of the cars may be used better – in other words, their load factor may be increased by allowing some price discrimination, which is certainly efficient.”

“Interesting. But is this really relevant for gas transmission? I see some similarities, but it’s a different service after all”.

“You’re right, it’s time to leave such examples aside and talk about our industry, but before we do that let me state a couple of general points that I think we have agreed on the issue. First, price discrimination is not necessarily at odds with cost reflectivity, for in cases where there are joint assets or production factors, the allocation of their costs between the products they contribute to is arbitrary. The only limits lie in the costs that would arise in case only one of the products were sold.”

“I am not sure to have got this further point”.

“For example, let's assume that a gas transmission network is serving a domestic market and a cross border market. The allocation of the joint part of the network cost to cross border or transit is arbitrary, but only within some limits: neither of them can exceed the costs that would occur if only one of them was supplied. This is called the *stand alone cost*. Since there are remarkable economies of scale in gas transmission, the stand alone cost may be much higher than the average cost. This is the upper limit of what I would call a cost reflective allocation. On the other hand, no customer or market sector should be charged less than the cost he is directly responsible for, that is the variable cost of transporting more gas, like the compressor fuel cost and pipeline leakages. This is sometimes called the *incremental cost*. What I am saying is that any cost allocation that is comprised between the lower and upper limits that are represented by the incremental cost and the stand alone cost, is an acceptable way of allocating the cost of the joint assets. Within such limits costs could be allocated, for instance, by market related criteria, for example approaching Ramsey's rule where user groups with lower price elasticity are charged more. Within such limits, I would say that there are no cross subsidies”.

Jenny was not happy at all:

“I understand the point, but I am not sure that a regulator can accept it. It is our goal to allocate costs in a fair way, and if there is a joint asset we'd rather split its related costs evenly, to avoid being charged of discriminatory behaviour. Moreover, I guess that users (and their end customers) that are less responsive to prices are those who have no alternatives, therefore your proposed rule amounts to exploiting network users that supply the weakest end customers on the markets. Your pricing rule amount to allowing speculators to exploit weak customers, that is exactly what regulators are supposed to avoid!”.

“That is not necessarily true – reacted Mr. Gloomy – but for a proper discussion let's assume that we are discussing of cost allocation, not cost level: the total allowed revenue is always the same, therefore if a TSO raises tariffs for a certain user it must lower them for others. Do you agree?”

“OK”

“Now, let's for instance suppose that the tariff system proposed by the TSO entails tariffs above accounting costs for suppliers to the residential market, and lower tariffs for suppliers of power stations. I am not sure whether the allocation that raises prices to the residential market eventually favours weaker customers: in fact almost the same people would simply pay less for gas but less for electricity, for the higher charges will have to be paid eventually by end customers of the electricity sector. What economics shows is that, if an inefficient allocation is allowed – for example because you are forcing an even split of some joint costs - you have what economists call a *deadweight* loss: the higher losses of those who are hit - the power stations, in my example - outweigh those who save - the residential sector, in the example. Beyond theory, the meaning should be clear: the reason power stations' demand for gas has an higher price is that power can be generated by other sources like coal, wind and others, much more easily and cheaply than heat, which is the main use of the residential sector demand. In other words, in the power generation market gas competes with cheaper fuels like coal or subsidised renewables, whereas in the residential market it competes against dearer fuels, mostly oil derivatives. Therefore, it is understandable that the gas industry tends to price that one more. Thus, if the gas transmission companies were allowed to make their own preferred tariff structure, they would probably adjust tariffs in a way to achieve higher margins from networks users catering to the residential market. For example, they would apply seasonal charges, with much higher value in the winter when most residential market consumption occurs, whereas the power sector demand tends to be less peaky or even to peak in the summer...”

“... due to air conditioning, I know it.”, Jenny completed his sentence. But now she was eager to tell him what she had in mind. She had understood the point, but did not agree at all:

“Of course I understand the point – she went on - but that's at odds with the energy policy of most European countries! Of course there isn't an official EU energy mix policy, but I'm sure that most governments would prefer to have more power produced by a suitable mix of coal and renewables – as required by the environmental policy objectives – rather than using natural gas. After all, coal is more reliable for security of supply, and if you adopt the proper pollution abatement technology and a suitable mix of coal and renewable, you could achieve, let's say the same amount of power generation at the same cost and with the same emission levels, but you would depend on natural gas, which is now increasingly imported and less reliable!”

“That's a reasonable policy position, and I fully respect it, even though I think afraid that if you really want to achieve such ambitious environmental goals you need a mix of renewables and gas, not coal. Yet, my problem is that in this way the tariff policy is actually affecting the whole energy policy. I can accept any energy policy objective – for example, in terms of security of supply or environmental sustainability. However, I would like to have market forces achieve the objectives in their own way, rather than governments or regulators deciding how to achieve them. Do you see how far we have gone? We started from price discrimination, and now we found that it may even affect whether and how the main objectives of energy policy will be achieved.”

He paused, looking thoughtful, then added:

“There is a basic economic policy rule, known after a Dutch economist, Jan Tinbergen, that we should never forget: if there are several objectives, there should be as many tools. We cannot use the same tools for all goals. I recalled that even during today's discussion, and when I was reading through the comments to the draft Guidelines. There are several goals that are well worth pursuing, not only allocative efficiency but also equity, market liquidity and competitiveness, the protection of weak and vulnerable customers, security of supply, the fight against global warming as well as local pollution, innovation and so on. However, you cannot address all of them by tariff policy. I had the feeling that today everybody was supporting a different approach by citing one or the other of such goals, but no conclusion – or if you prefer, *any* conclusions - can be drawn if we want tariffs -or any other tool - to pursue too many goals at the same time. Everybody asks to 'strike the balance' – that seems to be a fashionable expression today, but maybe the best balance lies in an explicit choice of objectives, and tools assigned to pursue them. By the way, there's nothing new on this: welfare economics textbooks have always known that there are trade-offs between equity and efficiency. And economists know very well that efficiency is only a partial perspective, and it can be subdued to other goals, notably in terms of equity.”

“Don't you think that the main goals of tariff policies should be customer protection and the establishment – or consolidation, hopefully - of a competitive and liquid gas market? After all competition is the best way of protecting customers, isn't that what economists always claim?”

“Sure, but if I have to tell you my priorities... let me tell you why I think that tariffs should address efficiency first today. This takes me a little bit back in the recent history of the industry. As you know, we have seen a painful transition towards a competitive market, which is not fully complete yet – that's what we are doing now! This transition has occurred mostly during a period of economic growth and particularly of gas consumption growth. In such situation, infrastructure was sometimes scarce, or more often not available for new market players, because capacity was mostly booked by incumbents, often through long term contracts, and contractual congestion was the main issue. Of course it was exacerbated by the fact that in many Member States unbundling was far from

satisfactory, therefore TSOs had little interest at developing capacity, or at maximising the use of existing pipelines. Even if TSOs wished – and I know that some of them were actually eager to do more – their owners prevented them from expanding capacity.”

“Yes, of course I know that story, that's what we've been fighting about for years!” Jenny looked a bit bored now.”

“That's a well known story, and in some cases it is still the main picture. However, in most of Europe, and particularly in the most advanced markets, the situation is now rather different. Unbundling is almost complete, most old incumbents have sold their networks or are about to do so. Lots of capacity has surfaced – also due to the macroeconomic slump, but not only. And there are very serious tools to address any remaining market power problems: capacity will be allocated by auctions, there are new congestion managements rules, and competition authorities are ready to intervene. What is more, TSOs have in most case little interest in restraining capacity. Actually they want to sell more, that's how they can make more money even if they are regulated. However they face – like the whole gas industry – a rather different business environment than prevailed for most of the last decade: gas demand is stagnating in most countries, not only in relation to the crisis; cheap coal is back and regaining market share, while the carbon market does not help gas at these price levels. Subsidised renewable energy and efficiency are prioritised. As a consequence of which most forecasting scenarios show a declining outlook for gas in Europe. Somebody is already planning to phase out fossil fuels altogether, or at most keep gas as a backup fuel.”

Jenny kept looking puzzled, but did not speak. She just wondered what relation all of that bored to tariffs. The man saw that and sped up:

“All of that is understandable, but you may wonder why this should concern tariff policy. I think that's very important. In a liberalised industry, or even in a regulated industry, tariffs are a very important managerial tool. Did you see the incredible evolution of tariff plans in telecommunications after their liberalisation? And what about air transport? You started this discussion by mentioning how taxis or airlines adjust their tariffs to compete with each other, or even more with rival transport modes, like trains, cars or buses. The same could well happen in the energy industry. Of course there are other goals, like the environmental impact or security of supply, however they are already pursued by other tools: differential taxation, cap and trade schemes like the ETS, subsidies, the coming infrastructure regulation, and others. Just let them work.”

Jenny remained sceptical, yet she wanted to fully understand where all this could lead.

“How and where could this work in practice, for gas transmission?”, she asked. “For , it's not like in the old times of the monopolies, when companies could just set their own different prices to each sector, or even to each customer. Nowadays, tariffs have to follow some criteria, and I hope you agree that no different prices can be charged for exactly the same service”.

“Fine, I agree in principle, at least for regulated tariffs. However I am not sure that we agree on what discrimination really amounts to.”

A rare smile flashed on his icy face. Then he started another long speech, punctuated by pauses, emphasizing a word every here and there.

“I think that there are three dimensions where price discrimination could occur in gas transmission. First, there is a *spatial* dimension. A geographically extended network, consisting of several interconnected pipelines, can be seen as a joint asset, and its services charged in some way to users. In fact, gas transmission doesn't usually feature such joint asset problems in the spatial dimension.

Normally, it is possible to define costs for each path. Gas molecules are not like electrons, their behaviour can be traced. Therefore I would say that for this dimension the opposite is just true: you can normally allocate costs fairly and without discrimination, but sometimes tariffs depart from cost reflectivity because they want to achieve other goals. For example, if a postal charge is used, longer distance flows would be subsidised by shorter ones. And even the most common methodologies for the calculation of entry - exit charges involve some averaging and therefore some cross-subsidies. Yet, regulators may prefer them, because they want to pursue other goals, like equity; or they think that entry-exit tariffs may trigger more liquidity with respect to a distance based one; or again, they found that more cost reflective tariffs are so close to the average that it is not worth departing from the simplicity of the postal approach – which can be true in some systems.”

“Can't we have large common networks shared by several flows?”

“Yes, notably in relatively small markets. I don't want to discuss entry-exit tariffs now, of course they have pros and cons, but that has been decided, and such decision must be implemented. The point is rather to implement it in the way that allows to maximise efficiency and minimize cross subsidies, if that's the goal”.

Yet Jenny felt that something was missing, and came back to her point: “Are you sure that the transmission network cannot be seen as a meshed integrated entity, where costs may not be easily allocated to paths? I was told that in some sections the gas flow is really unpredictable, or seasonal.”

“That can happen in some cases, for example where gas flows from several different directions and mixes up somewhere in the middle. In Europe, if you consider national systems like Spain, Portugal France, Britain, Italy, Greece and possibly others, you may notice that gas comes from many cardinal points, therefore flows mix up somewhere, directions may be uncertain or change by the season. However even in such systems distance does matter: for the main gas highways – for instance from Sicily to Northern Italy, or from Scotland to Southern England – you would agree that transportation distance does matter, and that it's not the same to haul gas for 100 or 1000 kilometres. It would be unfair as well as inefficient to charge them them irrespectively of distance. I understand that for smaller distances it would be just too burdensome to precisely calculate all of them, but at least the main cost related distances should be reflected in the tariff system.”

“Fine. On the other hand, whatever the system topology, I guess that some pipelines are shared by several customers. For example, pipelines could be shared by domestic users and by cross border flows. Would you recommend discrimination – or efficient pricing, as you prefer to call it – even in these cases”. Jenny had stopped walking and was now staring at him, as a sort of challenge.

“Well, in principle, why not? After all, that normally happens in competitive industries. You mentioned the story of your former colleague with his overpriced car. However I know that there is a lot of national sensibility about cross border transfers in Europe, just look at all those discussions on macroeconomic transfers, Euro-bonds, the role of the European Central Bank... that's about much bigger cross-subsidies than in our industry! In our case the scope is limited, as several pipelines are clearly not shared, but used for cross border trade or for domestic users. Even if I'd like it in principle, I wouldn't go for a big argument for such small efficiency gains. Anyway, this issue may resurface later, I expect that some TSOs will try to shift costs onto domestic routes, as cross border ones will face more competition, whereas national regulators could try the opposite. In transit countries they often seem to neglect that cross border flows are already bringing benefits to their countries: they enjoy economies of scale in transmission, and they are also exposed to more suppliers”.

Jenny wanted to reply about the alleged nationalistic attitude by regulators, but she also wanted to bring this discussion to an end, and understand all relevant points before she had to leave. Therefore she ignored the comment, resumed walking, and noticed:

“It seems fair. I'll think about it. What other dimensions could be involved by discrimination?”

“Well, mostly the *time* dimension. You could see that a network, or even a single pipeline, jointly supplies several services. For example, it can offer services of several durations, and for the shorter ones – like quarterly, monthly or daily products. Moreover, there is a seasonal or even a weekly dimension. Thus, companies may charge higher prices for similar products in different time periods. Public enterprise economics has analysed this dimension at length, for example through the theory of peak load pricing, which suggested that joint fixed costs should be charged mostly on the peak users: for example on the peak hours, or days, or months. Such principle has been often accepted and actually used by regulators, but if you consider it carefully it amounts to some sort of price discrimination, as costs of the joint asset are actually charged to the peak only, and not proportionally to some cost driver like consumption or capacity. If you just use the network off-peak you may even be allowed to use it for free, or pay a small variable cost.”

“That's what traders' associations always claim! they say that capacity should be available even for free – besides variable costs, that are small - if it has been already paid for by longer term capacity contracts. But I thought that was a faulty point. I remember some old reading” - she was now eager to show her theoretical background - “about a point raised by the Nobel laureate Maurice Allais. Free use of the network should not be allowed if you take the long term capacity perspective!”

“Yes, that's true, and there is more. Companies may discriminate in the time dimensions, but again, they do it in line with market demand. Therefore, they may even like to favour users who *ensure* that more capacity is actually used – and paid for. Didn't you report about that airline pricing practice, where early bookers actually pay less? or that people who use the same capacity more – like frequent flyers – are granted some discounts or other benefits? Companies with high fixed costs always want to fill their capacity as much as possible. On the other hand few of them award cheap capacity near real time of use, because they know that users would quickly get used to it and avoid booking earlier. Therefore, there is no reason to think that optimal capacity pricing would go in the direction that short term traders would like. In fact, I see that more discounts would be given to bulk, long term and early bookings, though not for the same reason as it happened in the past, when transmission operators were integrated with suppliers.”

“But we want to promote hubs liquidity! That's an agreed goal!”.

“I'm not sure that liquidity is better promoted by ensuring almost free short term capacity. The most liquid hubs in Europe, like the British NBP and the Dutch TTF, have not been fostered by the availability of free capacity. On the contrary, they greatly benefited from the Belgium-UK Interconnector, where all capacity is allocated long term and traded in the secondary market. In this way, the real capacity prices are actually decided in the market. Other sources of gas to those countries are also mostly allocated long term, like the capacity of some British LNG terminals, the BBL - and of course domestic production, which is very important for both countries.”

“Well, in fact capacity prices will be decided by the market anyway. They will be set in auctions, we should not forget that the tariffs we are talking about are just the reserve prices of auctions. Therefore, you should be satisfied that a market-driven outcome will emerge”, replied Jenny.

“Certainly a market outcome, but I am not entirely sure that an efficient market equilibrium will prevail. Ronald Coase, another Nobel prizewinner in economics, has taught us a very important

point: markets work well if property rights are solidly allocated, for only in such case they can be effectively used or traded. The case of British, Dutch and other North-Western European entry capacity that I mentioned are an example, as auctions have not had a major role then. More examples come of course from the U.S., where capacity is allocated on a long term basis but the secondary market is bustling. “. He paused again.

“Now, in the new European system with generalised auctions, we will not have that. All capacity will be allocated through auctions. It is true that some capacity is still allocated long term to legacy contracts, or through open seasons, and that some more could be allocated by long term auctions. However I wouldn't rely much on the last bit, everybody agrees that shippers feel that they can now get a lot of capacity at the reserve price near the real time, therefore they have little incentive to book it long term.”

“Still, I do not yet see why you are afraid that an efficient market outcome could not emerge”.

“The risk is that if shipper believe that they can get capacity short term at an artificially low price, they can just wait for it, and refrain from booking earlier. The market could be distorted. Besides, proposed rules do not specify that the reaction to such outcome should be aimed at restoring the market equilibrium.”

“What do you mean?”

“If there is excess supply for a service, for example long term capacity, and excess demand for another, like short term capacity, it is clear that prices are wrong - they are out of equilibrium as we say. Moreover that leads to under-recovery of the costs. However, despite this clear case of disequilibrium, it is not guaranteed that the equilibrium will be restored, which would require an increase of the short term capacity price. Instead, some regulators plan to increase the commodity charges, or to increase all capacity charges at the same rate. This would not restore the market equilibrium but possibly introduce further distortions.

“What's the alternative?”

“My preferred solution would be to allow companies the choice, or at least a proposal, of how to allocate costs between long term and short term, and among short term products, for example between winter and summer. Such proposals should be rejected only if there is adamant discrimination, for example prices above the stand alone cost or below the variable cost. On the other hand, regulators should not distort the market by restraining the companies' ability to allocate costs in line with market demand, within such limits. This concept could be summarised by an old slogan that is more effectively said in German: 'Verbieten verboten', or it's forbidden to forbid. Tariff regulation should be limited to the average level – that is, ensuring that the allowed revenue is not exceeded – and to a general provision banning explicit discrimination. Of course, prices should be offered to all shippers on a neutral basis, they should be based on objective criteria.”

“Don't you fear that transmission companies could envisage some odd tariff structure to favour their affiliated supply companies?”

“Should they? I think that is mostly a ghost from the past. Almost all transmission companies are now fully unbundled from supply interests, and others are being sold. Almost all suppliers have now understood that control of networks is no longer a strategic asset. Anyway, if you fear that, you could establish a tighter regulatory control for operators who aren't fully unbundled, for example those few that refrain from full ownership unbundling. That could be actually a further incentive towards full ownership unbundling.”

“Well, I got this point, I'll think about it too. Is there any other relevant dimension where we could discuss cost reflectivity and discrimination?”. Jenny was now starting to worry about her flight, and cut short any discussion.

“Yes, although this is not as relevant as it was in the past. Let me briefly consider the capacity-commodity split issue. As you noticed, wherever a fixed price component price of a service can be envisaged, price structures rarely match the ratio between fixed and variable costs. In retail markets, prices are mostly commodity related, which are preferred by customers who generally don't want to bear much risk. In network based industries like telecommunications we have also seen a tendency towards commodity related pricing and end customers can often skip fixed charges if they don't like them. Even in the charging of gas transmission services regulators have followed various approaches, and some of them have preferred to keep capacity related components below fixed costs – and even more in gas distribution. This was for various reasons: in some cases they wanted to provide incentives to companies to transport more gas; in others they wanted to keep lower prices for low load factors consuming sectors like space heating, possibly because these were perceived as premium uses from a social perspective. Still in other cases it is not clear why it happened, but you can notice a wide range of capacity-commodity splits, as reported for example in the 2009 KEMA-REKK Report. In fact, I have noticed a tendency to proceed towards ratios more in line with the perceived capacity-commodity cost split. However, all of this issue is losing relevance as short term capacity becomes available. If you feel that the capacity price is too high, shippers can probably buy it for shorter terms. For example, they could book a baseload annual capacity and then use monthly products tailored to their peaking needs. In this way, their payments become more in line with their actual use. In other words, they can just book the capacity they need every month, or possibly even on a daily basis, and their utilization rate will be very high. Of course, transmission operators will sell less total capacity than they used to, and will have to adjust unit capacity tariffs upwards to cover their costs; yet they can achieve almost the same results as with their preferred capacity-commodity split ”

“It seems that in this way the official capacity-commodity split becomes less relevant...”

“Yes, provided there are no constraints on the short-term/long term price ratios, the so-called multipliers. There are some constraints now in the draft framework guidelines, but if national regulators use their allowed flexibility then tariffs become in fact much more related to commodity-flows than they look like at first. I have some back of the envelope calculations on this point...”

He took a little notebook from his pocket, as if he had been just ready to discuss that issue.

“Look, under a monthly 100% capacity tariff – assuming no variable costs for simplicity - with a constant multiplier of 1.5, a shipper catering to a residential market with a load factor of 32% would pay just as if the capacity-commodity ratio were 46:54.”

“Wow, that's much lower than you would expect! What if monthly rates are seasonally adjusted?” asked Jenny.

“Of course you can have many different cases. A walk in the park is not possibly the best place to talk about numbers, but you see that you can't really talk about cost-reflectivity in this case. A simple rule on the multipliers would heavily modify the real expected capacity-commodity rate, and the cost allocation between network users. In the same example, that shipper would pay 27% above the system mean for each delivered energy unit; whereas with a pure annual capacity based tariff – if there were no available monthly products - he would pay 60% above the mean! And by using even shorter products, or maybe by using the secondary market, he could even pay less”.

Jenny was surprised once more in that already long day. Could actual prices paid by shippers for transmission change so much? However during the last explanation she had managed to check her watch. It was nearly time for her to go, and she was also rather tired. The sun had gone, and air was getting colder. She tried to reach a preliminary conclusion of all their discussion.

“So, I see that after all such guidelines would leave some substantial flexibility to national regulators and TSO's. After all, the draft Framework Guidelines that we have discussed today are consistent with your claim that cost reflectivity for the time dimension cannot be exactly defined. Do you agree?”

“In part. First of all, there is that 1.5 maximum multiplier that may still limit flexibility. However, my main basic problems lies in what you have just said: flexibility for national TSOs and regulators. I don't mind it being national, but should that flexibility belong to regulators or to transmission companies? You know, as an economist I tend to think that prices are very important. There are countless examples, even in gas regulation, and problems have occurred in almost all countries. But the most famous example of a country where all prices were regulated with no care for market demand remains the old Soviet Union. The famous French philosopher, Jean-Paul Sartre, who was originally a supporter of that system, changed his mind when he actually visited the country in the Fifties, and called it 'an engineers' society'. In a sense Sartre was right: that was a system where most prices were set by careful calculation - albeit in a few cases they were adjusted for political reasons. However the calculations only considered the supply side of the market, they didn't look at the demand response. For example I remember my visits to Moscow in the Eighties. The Western press often remarked that shops were empty in the Soviet Union, but they were not: I remember food supermarkets where meat shelves were indeed empty, but those carrying fish overflowed. The price of meat had been set too low, and that of fish probably too high. You may find the example a bit trivial, but isn't that happening already when you compare the prices of short term and long term capacity?”

Jenny shivered and looked at the man, who was now looking gloomier than ever. She had now been speeding up her pace, due to the lower temperature or possibly a natural fear of being in the park of a foreign city after dark. She saw a park gate and was heading for it, always accompanied by the man.

“Well, that story is dramatic, not trivial; but aren't we going too far? I don't really think that some distortions in gas transmission pricing will destroy the European economy.” she commented on his last remarks”.

“Probably not, but it may spoil gas transmission. It was and could still be a healthy industry, with as much regulation as necessary and many market signals it can use. Yet too much regulation may turn it into a state dependent entity, where it will be more and more difficult to distinguish between what is necessary and what is not. Of course, if gas itself will be reduced to becoming a backup fuel, that will happen anyway: at that point gas pipelines will be probably like roads: pure public goods that will need subsidies to stay alive. However that time is far away, and I think that a more market based attitude should still be given a chance.”

They had reached the park gate, and Jenny was relieved to see that taxis were waiting just outside. She did not think that she was cross-subsidizing other passengers any more, but it came to her mind that she thought she could well subsidise Mr. Gloomy after that long talk, and asked if he was going to the airport too.

“No, not really, Jenny, thank you. I will be walking in this park a little more”.

“Well, if that's the case... thank you for this chat. Have a nice evening!”, she shook the bony hand that was being offered to her and entered the first cab in the line. As it was driving away she turned her head to see where the man was going, but he had already disappeared in the darkness.