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Strive for better yield - Yara AS

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Introduction

This paper suggests that dynamic environments and structural changes in a global knowledge economy impose considerable needs for *knowledge-sharing* in multinational companies -- in order to achieve efficiency and adaptiveness (Nohria and Ghoshal, 1997). Understanding of how and to what extent multinational companies exchange, combine, use and exploit knowledge requires understanding of the challenges and complications of becoming and being an international company. From this perspective, the paper focuses on Yara and investigates Yara's historical development, the strategy behind the expansion, and Yara's current situation[i].

Yara International ASA is a Norwegian multinational chemical company which converts energy and nitrogen from the air into vital products for farmers and industrial customers. The company is the world's largest supplier of mineral fertilizers, it is a large supplier of gases and nitrogen based chemicals, and it has a strong sales and marketing presence in every part of world. The company's main markets are in Europe and in South, Central and North America (see appendix 2). By the end of 2007, Yara had 8200 employees (see appendix 1).

Formerly Norsk Hydro Agri, which had been Norsk Hydro's fertilizer activities since 1905, Yara demerged from Hydro in 2004 and became an independent[ii] company. Yara's main office is located in Oslo, and the company is listed on the Oslo Stock Exchange.

Founded in 1905 to take advantage of Norway's rich access to hydropower in the production of mineral fertilizer, Norsk Hydro developed its basic technology at home in order to transform a vision -- of feeding plants to feed people -- into reality. The founders[iii] were Sam Eyde, Kristian Birkeland, and Marcus Wallenberg. Each of them is described as a person

of unusual stature in his own right; and their joining forces, at a historic moment, is described as a singularly fortunate coincidence. Shareholder and loan capital, however, came from foreign sources. Only eight percent of the shares were held by Norwegians. The Swedish bank Enskildabanken of Stockholm controlled half of the shares; the French bank, Paribas, held controlling ownership in Hydro up to the Second World War; Germany's IG Farben[iv] was also a major shareholder from the late 1920s. After the second world war, the Norwegian state took over IG Farben's shares and became the dominant shareholder (43-51%), but without ever becoming directly involved in the company's operations. Thus, Hydro was a company in which the top management had freedom, manoeuvring-room, and high discretionary power. The relationship between the state and Hydro was, nevertheless, very close. Norsk Hydro was founded in the same year as Norway became a free and independent nation, and Hydro became a strong driving force in Norway's growing industrialization. In this way, the company became an institution that played an important symbolic role in the building of the new nation. Hydro was considered a "national champion" and the government provided a very favourable regulatory framework for its energy-intensive activity.

Hydro's (Yara's) historical timeline shows an interesting and fascinating development that traces Yara's roots back to the pioneering phase of the modern fertilizer industry. It portrays a company that rose to technological, organizational, and political challenges within the fertilizer industry, and which grew from a firm that primarily operated in the Norwegian and Danish markets to a large and global company.

This paper addresses organizational challenges Hydro / Yara faced, over time, in its growing business, and it analyzes how the company rose to these challenges. The paper also explores how and to what extent Yara has developed arenas that facilitate acquiring, sharing, exploiting and using of knowledge within the company. From this point of departure, the description and the analysis of Yara are based on two assumptions:

- Norms and beliefs that evolve at the very earliest stages of an organization's development might thereafter continue to drive, shape and guide behaviour (related to exchange and combination of knowledge and other organizational aspects).
- In order to achieve a balance between short-term efficiency and long-term adaptiveness organizations need capabilities to handle the tension between existing (old) norms and beliefs and new ideas and perspectives that may challenge or contradict the existing norms and beliefs.

In the following, the paper first presents some theory related to these assumptions. Then it describes phases in Hydro's / Yara's historical development, and it analyzes how the company rose to these challenges. Third it describes Yara's current situation regarding values, business model, and organizational structure. Fourth, it describes types of knowledge that might be exchanged within the organization, and it discusses arenas for knowledge sharing. Finally, the paper challenges Yara's pursuit of shared values, norms, and beliefs -- aspects that might enable communication and knowledge-sharing.

Theory

Structural theories of organizations have adapted a rational view of organizations in which organizational goals are clear, cause-effect relations are well understood, technologies are strong and conflict is minimal and easily resolvable on the basis of unambiguous facts. That is, governance is based on the logic of bureaucratic coordination and control. However, there are a number of critical reactions to the rational, structural approach (Bolman and Deal, 1997). One of these is the cultural approach to organizations. For example, Schein (1992) identifies three distinct levels in organizational cultures; artefacts and behaviours, espoused values, and at the third and deepest level, tacit assumptions. Such assumptions are the elements of culture that are unseen and not cognitively identified in everyday interactions between organizational members. They may evolve at the very earliest stages of an

organization's development and thereafter continue to drive and shape behaviour. In this way, tacit assumptions in terms of beliefs and logics may cause paradoxical organizational behaviours and interpretations. For instance, a firm may officially claim that its expansion is a result of pursing rational business goals but important organizational actors may interpret the expansion from another type of logic.

A second critical perspective of the rational approach is the political approach -- associated with power and conflicting interests. The preferences or identities embraced by some organizational actors might be inconsistent with the preferences or identities of other actors. What is intelligent from the part of view of some part of the organization is not intelligent from the point of view another part.

The three perspectives reflect the debates about the logics, forms and practices of governance emerging in modern organizations. These debates have crystallised around the cumulative effect of the complex interaction between "globalization", "informationalisation", "individualization" and "marketisation" that seems to undermine and erode ideological foundations of governance strategies and structures dominated by the logic of rational organization and control. Thus, we might see a transition -- from relatively simple, well-integrated and inherently stable governance systems, based on the logic of bureaucratic coordination and control, to more complexes, fragmented and unstable governance systems based on the logic of network coordination and control and founded on autonomy and knowledge.

Governance describes the process of decision-making and the process by which decisions are implemented in organizations. Such processes might be related to creation of strategic advantages and to knowledge development and knowledge-based value creation. Concerning advantages, in most theories of why and how firms become multinationals, the

existence or creation of advantages plays a key role (Barney, 2001). Bartlett and Ghoshal (1998) suggest that firms operating in global markets are at a serious strategic disadvantage if they are unable control world-wide operations and manage them in a globally coordinated manner. The application of the power of headquarter over local fiefdoms is one important advantage in achieving closer integration. Dunning (1993, 1997) claims that a multinational enterprise needs an advantage over the companies in the host country because the latter are adapted to the national institutions, the culture and political conditions. This advantage might be related to ownership-specific advantages, location-specific advantages, and advantages associated with building a network of units within the firm across national borders. Moreover, Chandler (1962, 1977, 1990) points out that corporations grew through the help of substantial expansion of their organizational capacity, through professionalization of management, and development of a management structure that adapts to business strategies i.e. objectives, routines and practises aligned to strategic priorities in ways that make strategic fit. Finally, Nahapiet and Ghoshal (1998) argue that social capital has to be developed if synergies are to be achieved.

Regarding knowledge development, knowledge is, on the one hand, a condition for governance (Scott and Davis, 2007). On the other hand, knowledge as the most strategic significant resource of modern organizations might be the object of governance (Kogut and Zander, 1992; Nohria and Ghoshal, 1997; Teece et al., 1997; Argote and Ingram, 2000; Choo and Bontis, 2002; Teece, 2007). From a knowledge-creation perspective, Nahpiet and Ghoshal (1998) argue that social capital is important for effective knowledge transferring across organizational unites and between organizations. Social capital has a structural, a cognitive and a relational dimension:

- The structural dimension refers to the presence of specific networks or interaction ties across actors, units, and organizations.

- The cognitive dimension refers to shared interpretations and systems of meaning, and shared language and codes to enable communication.
- The relational dimension refers to the creation of social networks, norms, trust, reciprocity, obligations, respect and friendship which facilitate the sharing of explicit and tacit knowledge.

The structural and relational dimensions define social capital as networks of formal and social relationships within and between groups and communities. The cognitive dimension emphasises that the individuals work skilfully and cooperatively because they are committed to shared values, norms and logics. Arenas for exchange and combination of knowledge emerge, but Gratton (2007) argues that is possible to actively design for their emergence. She identifies four elements that make development of appropriate arenas more likely. The first is a *cooperative mindset* across the company. The presence of such a mindset depends in part on avoiding recruiting uncooperative individuals, but more important on the deeper values and underlying basic assumptions of the company. These may or may not be reflected in the rhetoric or value statements of the company. One way to identify underlying assumptions is to examine the rewards systems and performance measures. For example are rewards systems designed on the assumption that employees are motivated to maximize their self-interests? Do performance analyses generate a strong identification with one's work group so that "screwing the competition" actually means out-doing other teams within the company is the norm? However, cooperative mindsets of themselves can be harmful in the sense they can lead to a "country club" mentality. To avoid this there also has to be a mindset of moral and intellectual excellence. The second element is the presence of *boundary spanning* individuals, i.e. individuals who are adept at working cooperatively across boundaries in order to build networks with people very different from themselves. They are introducers and connectors of people some of whom may never actually meet face-to-face. Crucial as both a cooperative mindset and boundary spanning are, they do not actually create important arenas for knowledge sharing. This requires, argues Gratton, an *igniting purpose* for the company that

has to be defined and consistently communicated across the company. Finally, if such arenas are to be productive as well as innovative, the people in them have to engage in *productive practices* such as appreciating one another's talents, making explicit commitments and engaging in conflict resolution i.e. that individuals work skilfully and cooperatively within contexts in which conflicts are suppressed by commitment to shared values and norms.

We suggest that the three organizational perspectives and the idea about social capital are important to bear in mind when examine the case of Yara's expansion and current situation. For instance when reflecting on Yara' organizational structure it will be worth considering how and to what extent the company has designed appropriate arenas for knowledge sharing. It also will be worth considering what type of knowledge the participants exchange and combine within the arenas and what types of knowledge they should exchange and combine.

Yara's historical development[v]: Timeline — related to production and sales

Sales	Production sites
	Kemira, Finland 2007
	Adubos Trevo, Brazil 2000
	Kynoch Fertilizers, South Africa 1999
Office Harare 1985	ENICHEM Argicoltura / Fabbriche Chimine Terni, Italy 1996
Terminal Chiwan, China 1982	Rostock plant, Germany 1991
	Windmill / Hamn Chemie, Netherlands /Germany 1986
South America Sales office, Rio de Janeiro 1977	Cofaz, France 1986
Hong Kong Cooperation for sales in Thailand 1972	Ruhr Stickstoff, Germany 1984
	Fisons, UK 1982
Sales agency San Francisco 1946.	Supra, Sweden 1981
Sales office Stockholm 1945	NSM Netherlands 1979.
	QAFCO, Qatar 1969
Sales office Copenhagen 1919	Ammonia production Porsgrunn 1964/67
	Glomfjord plant 1949
	NPK production Porsgrunn 1938
	Porsgrunn started 1929 Nitric acid, CN
	Ammonia production Rjukan 1928
	Production Rjukan 1911
	Production Notodden 1907
	Norsk Hydro founded Norgessalpeter first product 1905

Hydro's fertilizer business had entered the international arena early with small-scale fertilizer exports. However, it was after 1945 that Hydro Agri strengthened its international presence[vi].

From the mid 1960s, Hydro augmented its fertilizer production capacity – considerably in several instances -- by building new production plants, increasing productivity, and removing process bottlenecks. These steps yielded a surplus production that was distributed almost entirely to the overseas markets through the Nitrex organization.

In 1961, nine Western European producers and producer associations entered into a cartel, Nitrex. This marked a more explicit division of the global fertilizer market -- between the market within Western Europe and the market outside Western Europe. Nitrex undertook to organize the sale of fertilizer from Western European producers to distant export markets, first and foremost Asia. Exporters outside of Europe were invited to join, but producers from the United States, Great Britain, and Canada were left out because of their relatively stringent antitrust laws.

Hydro considered the cartel important because prices could then be pushed up for export to overseas buyers. But the most important reason to join Nitrex was that it became the central meeting place for discussions about market behaviour in the members' home markets. Market shares within Europe were agreed on in detail. Hydro achieved, for example, an early confirmation that Scandinavia would be regarded as its home market. German, and to a certain extent Dutch, producers had access to the northern markets, but they had to keep it within limited market shares. Up to the early 1980s, the members of Nitrex carefully considered major features of the market -- establishment of distribution companies, increased sales, or buyouts of competitors -- in relation to how competitors would react and how to respond to countermoves.

Thus, the structure of the fertilizer market in Western Europe was strictly regulated by rules of the game -- characterized by tacit and explicit agreements on market shares between the major producers. As a consequence, Hydro did not have any significant sales in the attractive Western European markets. However, throughout the 1970s Hydro developed a

strong desire to establish itself in the Western Europe region. At the same time Hydro also developed a desire to expand outside of Europe. That is, Hydro's top management was looking for opportunities to change the rules of the game that governed market operations.

Expansion within Western Europe: Expansion and integration problems

Throughout the 1970s Hydro's top management developed a strong desire to penetrate the attractive Western European fertilizer market. The top management agreed that this expansion should take place through acquisitions, not through efforts at market penetration that would disturb the balance in the market. The decision to expand was made against a background of strong faith in the future of increasing fertilizer utilization, which in turn was based on the belief that the continually increasing productivity of agriculture in Western Europe would demand more fertilizer -- as well as greater use of compound fertilizers -- where Hydro had good production processes and a well-established brand name. In the following we first describe the Western European fertilizer market. Then we describe Hydro's expansion within this context, and finally we describe the integration problems Hydro faced.

The Western European fertilizer market

From the early 1980s, the Western European fertilizer industry went through a dramatic and occasionally painful restructuring process. The establishment of a common European market had already brought about a series of shifts where smaller producers merged with or were bought up by larger firms. The most significant restructuring occurred, however, as a result of two dramatic price drops: the first in 1986, and the second early in the 1990s after the fall of the Berlin wall. The production of nitrogen-based fertilizer -- which was decidedly the most

important type in the Western European markets -- dropped from 27 million tons in 1980, to 20 million tons in 1990, and further to 16 million tons in 2000. The number of producers fell significantly.

During this period of comprehensive restructuring, the internationally oriented manufacturers from the 1970s either withdrew or reduced their fertilizer activities. The one exception among the majors was Hydro which expanded substantially in Western Europe. Hydro made major acquisitions in the Netherlands, Sweden, Great Britain, France, and Germany from 1979 to 1986. In the 1990s, Hydro continued to gain new acquisitions in Europe, as well as expand its reach in the rest of the world through both acquisitions and establishment of new plants. In these ways, Hydro became unquestionably the largest fertilizer manufacturer in Western Europe during the mid 1980s, and in the 1990s, the world's largest. In 1978 Hydro Agri had 3000 employees and in 1986 the number of employees had increased to 13,500.

Hydro's first and very important step into the European market was the purchase of *Nederlandske Stikstof Maatschappij* (NSM) from the Italian company Montedison and ICI in 1979. NSM was modern and well run. It had both the industry's most cost-effective production of ammonia and a very well developed distribution network on the continent, plus a reputation for being able to sell in volume to the surrounding countries. This distribution network could be used not only offensively, but also defensively: Hydro constantly feared a more powerful German penetration of the Danish market, and the acquisition of NSM provided sales channels that could be used in response.

The acquisition, which amounted to about 800 million Norwegian kroner (NOK), was controversial among Hydro management -- particularly within the key economy and finance staff. However, the takeover took place just before fertilizer experienced a dramatic price jump, which helped pay for the acquisition in less than two years. An important reason for the

rising earnings was that Hydro used NSM to expand, especially in the German market, to a greater extent than would be expected in accordance with standing tradition.

Repercussions followed. First, Superfos, a Danish producer which supplied both the Danish and the German markets and which cooperated closely with the German company Veba, gave notice that it would establish itself in Sweden if Hydro did not tone down its aggression. Second, the historically good relationship between BASF and Hydro was seriously damaged. At a top-level conference between the two companies, the Germans complained that Hydro's behaviour had created a drop in prices and hurt the profitability of the German fertilizer companies. Hydro's top management explained that supplies had been increased because "despite our protests" BASF had sold a shipment of compound fertilizer in Sweden. The conclusion at the meeting was that the companies would stay in close contact so that a similar situation would not arise again.

In 1981 Hydro bought a 75 percent stake in Supra AB in Sweden. This was the largest Norwegian-Swedish industrial merger to that time. The Supra group was the result of an earlier Swedish merger and the company could trace its roots back to 1882. In 1982 Hydro purchased the British company Fisons' fertilizer division. Fisons held a 25 percent share of the British market, selling about 5.2 million tons of nitrogen fertilizer annually, a relatively large percentage of which was compound fertilizers. An additional attraction was that Fisons' sales were significantly higher than its production. This paved the way for also securing sales to Great Britain from other facilities in the Hydro system. The price was very low, 50 million pounds, but hidden in the price was Fisons' uncompetitive cost structure and acute need for expensive improvements and upgrades in its many factories.

During 1983 attention turned to the continent. Hydro continued to penetrate the German market, achieving a market share of about 10 percent. BASF responded by

establishing sales organizations in the Netherlands, Norway, and Sweden -- an expected move. However, BASF had problems gaining market shares in Scandinavia. After two-and-a-half years, the Germans had won just 5 percent of the Norwegian market, and progress halted. What Hydro had not expected was that the German companies lowered their prices by 15–20 percent in their own markets.

At this time, Hydro was continually developing plans to increase activity in France, by far Europe's largest fertilizer market. Hydro's primary goal was not to buy one of the large and somewhat ineffective French companies, but rather, to continue to sell fertilizer from established facilities, which could be routinely expanded and upgraded. Following the same pattern as the penetration of the German market, Hydro sold more and more fertilizer in France. By 1985, its market share reached about eight percent, and relationships with the large state-owned fertilizer companies became strained. These companies had cost problems, were poorly financed, and were nationalist in their orientation. Hydro, thus, never really feared that the French would respond by establishing operations in Scandinavian markets. Instead, Hydro found that the French strategy was to block its attempts to increase sales in France. For example, the ongoing export of fertilizer to France was made very difficult by introducing new security regulations for the transportation of fertilizer products.

Ultimately, Hydro had to purchase control of a larger French company to increase its market share there. Thus in 1985, Hydro chose to buy France's second largest fertilizer enterprise, the state-owned Cofaz. Again, the cash outlay was very low, but Cofaz was a company with almost no share capital and reserves, plus a net debt of 3.4 billion francs. The factory also needed restructuring. The purchase became even more costly through a series of conditions that the French state attached to the takeover, the most important of which was that Hydro was committed to building a new ammonia factory at the estimated cost of a billion

NOK. The factory was completed two years later in 1988, when the West European markets had collapsed and there was a clear need to rationalize production capacity in Europe.

At the same time as Hydro made its acquisition in France, the German company Veba wanted to go out of the fertilizer business and offered Hydro its production company Ruhr Stickstof for a very reasonable cash outlay. Ruhr Stickstof was West Germany's second largest producer, with one large and four smaller production facilities. Several of the small facilities clearly faced closure. Hydro purchased the company, and the idea behind the acquisition was that it would allow Hydro to further increase its market share in West Germany without new price reductions.

Expansion and management

Hydro's ambitious expansion in Europe was supported by Hydro's top management, but the driving force was the head of the Agri Europe division. The head of the division had high discretion power and created an enthusiastic, entrepreneurial team that was tightly coupled to Hydro's top management but loosely coupled to the division's formal organization. This team was highly action-oriented -- driven by the pleasures of expansion process in a way that did not fit well in to a calculus type of leadership. That is, it was rather optimism and self-confidence than economic calculation that gave premises to decisions, and it appeared to be a kind of "winner's curse" in the acquisitions.

Impacts of price drops in 1986 and 1991

In 1986, prices dropped substantially for all types of fertilizer in Western Europe. The market change was largely due to a fall in oil prices, but the market was influenced by other factors

too. It was a change in Western Europe's pattern of trade for fertilizer. Not only did imports from Eastern Europe and the United States gradually begin to increase, but also -- and more important -- the market responded to major global shifts. China, India, and many other Asian countries had, over several years, built up their production capacity for fertilizer. Hydro itself had for many years profited handsomely from the sale of technology[vii] to the new producers. Several Asian countries severely curtailed imports as domestic production increased. Thus, the Asian markets did not function any longer as a surplus market for European and American fertilizer as their domestic producers became stronger. Moreover, increased production capacity was also being built up in the Middle East, based on access to low-cost natural gas, and intended for export to Asia and Africa. Now these producers turned toward Western Europe.

American fertilizer producers also helped increase supplies for the Western European market. American agriculture was in a crisis, and the Reagan Administration subsidized farmers who let their land go fallow. This resulted in a marginal decrease in the demand for fertilizer in the US, and the producers compensated by export to the European markets.

The Western European fertilizer producers faced a long-term profitability problem, which substantially increased in the late 1980s and early 1990s. The changes were driven by several forces. First, the national borders in the fertilizer markets gradually eroded and the industry became more global. Second, a reduction in budgeted allocations to agriculture resulted in a decrease in cultivated area in Europe, and -- painfully for Hydro -- a transition to less expensive types of fertilizer. Their well respected but expensive compound fertilizer increasingly became a niche product. Third, the fall of the Berlin Wall in the early 1990s led to a substantial increase in fertilizer exports from the former Eastern Europe. As a consequence, the Western European industry undertook substantial structural changes, closing down a number of units. Again, Hydro could afford to buy, but Hydro’s acquisitions were far

smaller and of more limited strategic importance in the European context than those made prior to 1986.

Hydro closed a large number of factories and rebuilt and streamlined the remaining ones. In the years 1986–1988 Hydro invested about ten billion NOK in rebuilding and improving, and another six billion in 1991-1993 (current prices). In the years 1986-1988 the workforce was reduced from 13,500 to 10,000. In the following years, Hydro, as the dominant producer, attempted to stabilize prices, partly by limiting production in weaker periods. This probably slowed down the structural changes that were taking place, and solidified the problem of overcapacity. In terms of the bottom line, results during these periods were very weak. Despite a few good years, particularly 1994–1997, it is clear in hindsight that sinking capital into the Western European fertilizer industry proved to be an unfortunate move.

The description illustrates that Hydro Agri Europe faced two problems. The first was related to overcapacity and the second was related to integration problems. The following description shows how Hydro tied to handle and solve these problems.

1994-1999: Reengineering and SAP

In 1994 Hydro's top management decided to implement a large and very ambitious reengineering project in Hydro Agri Europe -- in order to improve efficiency and effectiveness of the processes that existed within and across the fertilizer plants. The project included 19 production sites and a total of 72 sites throughout Europe. Its most important objectives were reengineering the division into one profit centre (synergy between processes through global organizing), customer focus and a powerful market organization: The focus was on establishing "common" work processes and organizational routines across the whole organization. When these were in place they were assumed to serve as a platform for closer

integration, and in that way enabling organizational tighter control. A central element in the reengineering project was the implementation of advanced SAP-technology.

The reengineering project faced many challenges and obstacles. In line with traditional Hydro management policy, the acquired companies were still running "hands off"; i.e. as autonomously as possible. Thus, the project, associated with central organizational control, raised very strong resistance. This could be observed at all levels in the organization, not least by top management of the different national companies.

The reengineering project was intended to bring about radical changes, fast. In reality, the organization remained more or less the same. The ambitious SAP project was initially assumed to support the new reengineered organization, but on several occasions it had been permanently close to collapse.

2000: The turnaround process

In 1999, Hydro's top management announced that the company's fertilizer business was not returning satisfactory results, and Hydro Agri was told that radical changes that would lead to improvements were needed. Within the European market there was an existing overcapacity of above 2.5 million tons. For Hydro Agri Europe the message was very clear: no new funds for investment would be made available before the business achieved a respectable level of profitability. At the same time, Hydro stated that its marketing strategy would be changed. Installing price reductions, Hydro Agri should begin to work purposefully to acquire large, key customers.

A new management arrived in Hydro's fertilizer division, and in collaboration with the other agents within the European fertilizer industry, the division played a leading role in the restructuring of the industry. Attention was focused on three drivers: lasting productivity

improvements, active portfolio management, and growth through smaller shares. The turnaround process aimed at meeting the profitability and efficiency targets through ambitious cost saving, divestment from none-core activities, reduction of production capacity, focus on lean production, and reduction in the work force. As an outcome, fixed costs were reduced by 35 percent; a financial target of a 10 percent return on invested capital was made possible; production capacity was reduced by 1.2 million tons (altogether the European industrial capacity shrank by about 2.5 million tons); production per employee rose to almost 3 500 tons compared with the 2 500 ton level of the mid-1980s; and a just-in-time logic was implemented in order reduce storage. Finally, the change process led to clearer definition and standardization of organizational routines, to clearer definition of responsibilities and accountabilities, and which again led to integration of the plants and to vertical integration of the company (cooperation between upstream and downstream activities). After two years, improved productivity placed Hydro Agri in the industry's upper quartile, and further improvement measures were defined. Thus, Hydro Agri boosted its position as a result of the restructuring of the industry. The contraction also initiated a trend toward rising prices internationally. In this way, the turnaround formed the basis for the decision to spin off the fertilizer business as an independent listed company from the second quarter of 2004.

However, the turnaround was the toughest change process in Hydro's history. It resulted in closures of seven production plants, a reduction in the workforce from 8,500 to 6,000 employees, reorganization of functions related to production, logistic, sales, and marketing, layoffs of managers, and to a process in which managers had to apply for new jobs in the company. (From 1986 to 2002 the number of employees had decreased from 13,500 to 6,000). The turnaround process created reactions, but within Hydro Agri Europe it was a shared understanding that the division had to make changes in order to survive. The change

process was tough, but it was also a shared understanding that it was a fair process which was guided by procedural justice.

Expansion outside of Western Europe: Differentiation and success

In 1968, the managing director of Hambro's Bank in London phoned to ask whether Hydro was interested in taking part in a fertilizer project in Qatar. For Hydro this telephone conversation was to lead to the company's first major fertilizer production involvement outside Norway, and for the future partners it was the start of a long collaboration, with the commissioning of Qafco-1 in 1973 marking the first major milestone. Qafco was (and still is) owned 25 percent by Hydro / Yara and 75 percent by Industries of Qatar. (Qatar Fertilizer Company now has four fertilizer plants. Qafco 2 came on stream in 1979, Qafco 3 in 1997, and Qafco 4 went onstream in 2004 and made Qafco the world's largest producer of urea. Qafco 5 is under construction[viii]).

Hydro Agri took its first steps into Asia in 1972, through the establishment of Norsk Hydro (Far East) in Hong Kong. The aim was to establish a sales and marketing network ahead of the urea production that would come from the Qafco joint venture. However, with Qafco1 delayed for one year, Hydro found itself instead looking to market NPK to Thailand. Hydro was attracted to Thailand because of the agrarian economy, with agricultural land largely under private ownership. After Thailand, Hydro continued to look to Asia (China, Vietnam), but with Africa, Latin America, South America, and Australia following closely behind.

Hydro Agri's focus was undoubtedly on emerging markets worldwide, but its long-established operations in the mature North American markets were not overlooked. The North

American market was important for marketing and distribution, and Hydro had been in the US since 1946 and operated through Hydro Agri North America (HANA), with a corporate office in Tampa, Florida.

As a consequence of the expansion, Hydro's fertilizer sales outside Europe increased rapidly, from just over 1 million tons in 1982 to 7.6 million tons 1998. Over the same period, ammonia sales rose from around 600 000 tons/year to around 4 million tons/year.

Hydro Agri International (HAI)

In 1998 Hydro decided to split Hydro Agri into two divisions: Hydro Agri Europe (HAE) and Hydri Agri International (HAI). The new structure acknowledged that the management challenges of internationalization related to the markets outside of Europe were very different from those related to integration and reengineering issues facing the European operations. Reflecting the growing internationalisation of the fertilizer business, HAI transferred its marketing responsibilities for international fertilizer trade from Oslo to Paris.

HAI was a highly multi-faceted division. It encompassed all Hydro's fertilizer and ammonia production and bulk blending outside Europe, including joint venture operations; all international marketing of Hydro fertilizers outside Europe, joint venture, and third-party fertilize products, including domestic marketing activities in developing markets; plus Hydro's network of fertilizer import/export terminals outside Europe. Additionally, HAI was responsible for all Hydro's ammonia trade and shipping worldwide.

HAI was involved in the production of 8 million tons/year of fertilizers and intermediates in 15 countries across Asia, North and South America, the Middle East, Africa

and the CIS. HAI had wholly owned ammonia production in Trinidad, through Hydro Agri Trinidad, and NP/NPK/AN bulk blending production in eastern Canada and in the northeast of the US, through completion of the acquisition of Nutrite in 1996. It also has smaller-scale NP/NPK blending facilities in several African and Latin American countries. HAI operated eight domestic marketing companies, either fully or majority owned, across Africa -- in Kenya, Malawi, Ivory Coast, Zimbabwe, South Africa, Egypt, Benin and Cameroon. It also operated seven in Latin America -- in Argentina, Brazil, Chile, Colombia, Guatemala, Uruguay and Venezuela. In addition to output from its own and Hydro Agri Europe's production facilities, HAI had access to additional quantities through marketing agreements with its joint venture partners and other third-party fertilizes producers. Significant third-party agreements were in place, for example, to market products from the new Pusri Line in Indonesia. Third-party fertilizer products, which accounted for about one-third of HAI's sales, were a key element of the division's strategy. However, the division was not a commodity trader. The division was in the trader business because Hydro had the organisation to handle third-party products.

Expansion and management

In strengthening its business into developing markets worldwide, HAI strived to get as close as possible to its end- customers, the individual farmers, much more so than had traditionally been the case in commodity fertilizer trading. The head of the division believed that the division's competitive edge derived from its "domestic marketing" concept, through which it maintained direct involvement throughout the fertilizer chain: from production through shipping, importation and storage, to final distribution at local level to the grower. Through this strategy the division established clients, offered reliability of supply and achieved

stability in pricing. Thus, the management belied that domestic marketing ventures included an important role for a strong national partner. Local partnership would bring cultural and national understanding to the business as well as continuity of operation. The management also belied that HAI was able to work through its domestic marketing initiatives to demonstrate its commitment to ethical values, environmental issues, and best farming practices. In these ways, the management valued a cooperative mindset associated with cultural understanding. The head of the division emphasized networking, friendship, trust, and pleasures of the leadership processes in terms of the joys of collaboration, commitment, the excitement of influence, etc. These aspects, together with domestic marketing and local partnership, provided a winning strategy in which the Viking Ship logo became a recognized guarantee of quality. That is, the head of the division emphasized participative decision-making -- associated with "consensual" or "facilitative" power which became manifested through cooperation: "We worked together in a creative and collaborative way"…. "Our capacity and capabilities arose from the intelligence and insight of people working together." Within this context, the members of the organization were more stressed by the customers than by the management. The organizational outcome of this approach was en economic success, but it also led to differentiation and integration problems. HAI was a loose coupled system in which the subunits became integrated with their environments -- customers, suppliers, and partners. It was also a loose coupling to Hydro Agri Europe. As a consequence, HAE's problems became HAI's advantage; i.e. HAI could sell and earn on products which HAE produced at a loss.

Which advantages, if any, turned Hydro Agri (Yara) into the world's largest producer of fertilizer?

Which advantages, if any, facilitated Hydro Agri's expansion? *First*, regarding cost advantage, Hydro (as a Norwegian located company) did not have a definite cost advantage before the expansion[ix]. The fertilizer industry is highly energy-intensive, and the most significant competitive advantage is increasing share of ammonia production in low cost natural gas regions. (Yara has today a lead in the ammonia value chain and a large-scale ammonia/urea production -- based on low-cost gas in Qatar and Trinidad). Nor did its growth create advantages in productivity and cost efficiency through the internalization of transactions that previously took place in the market. Within the European context the management followed a "hands off strategy" that was more beneficial for disintegration than for integration, and outside of Europe the management followed a "differentiation strategy" that led to integration between subunits and their environments.

Second, concerning location-specific advantages, Hydro was a firm that operated in a small domestic market, and such a firm will probably have lot to win and little to lose by opening a branch in a foreign market. When the foreign market is large, even a small share of the monopoly profit in this market will make up for repercussions of counter-establishment from competitors. The case describes how Hydro penetrated the Western Europe market that was previously dominated by much larger companies, and that was characterized by tacit and explicit agreements on prices and market shares between the major producers. That is, the major actors' behaviour had long been characterized by strong market discipline. Hydro's expansion eroded this discipline, and the question is: How could Hydro redefine the rules of the game?

As a relatively small firm, which controlled its home market, Hydro could more quickly break out of a system with defined market divisions than a big firm from a larger country -- in which there were several competitors. From this view, Hydro's advantage was the company's location-specific conditions that created opportunities for the top management to redefine constraints that the competitors more or less did take as granted. Hydro's top management adopted a new mindset that contradicted the existing mindset and legitimated rethinking of the rules of the game. Thus, the top management expanded its managerial discretion and removed the handicap which had prevented Hydro's efforts to penetrate the Western European market.

Third, regarding ownership-specific advantages, Hydro was a conglomerate which generated large profits through its oil and gas activities[x]. This money kept the fertilizer division alive. Without it, the combination of high capital outlays and weak earnings from the fertilizer investments in Europe would have been fatal for the company. The division got the money because the Agri division had support from Hydro's top management, but when the division lost this support it had to make radical changes.

Fourth, concerning management advantages, one advantage could be related to managerial discretion and strategic planning. Hydro's top management had high managerial discretion, but the question is: How did the management use its freedom, elbowroom and power in strategic planning, or how did the management define its direction, and making decisions on allocating its resources to pursue this strategy -- including its capital and employees? Various business analysis techniques could be used in this strategic process, for example SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) and PEST analysis (Political, Economic, Social, and Technological analysis). Through such analyses the

management could create an overview over own resources, the market, and competitors, and it could develop a shared outlook on prospects for earning, and future development.

Hydro's top management developed a far more optimistic evaluation of the West European fertilizer industry than most of its competitors[xi]. Indeed Hydro's evaluation was too optimistic, and it appeared to be a kind of "winner's curse" in the acquisitions: It was Hydro as the most optimistic company that ended up in a purchasing situation.

The top management analyzed the situation and did use time when Hydro decided to make the first acquisition in Europe in 1979. This acquisition turned out to be a financially rational and well-thought-out decision, but later on the top management made several more acquisitions --before the agents had sufficient information as to whether an investment was a good one. The management repeated decisions because the agents learned from the *first success* and because of the pleasures of the acquisition processes rather than because the outcomes turned out to be good. The agents learned from one success-case and later on they learned from anticipation of positive consequences. They treated anticipations as though they were outcomes, so that high expectations seemed to have the same learning effect as successful outcomes. As a consequence, Hydro did not see the writhing on the wall until it was too late. The company had, by all accounts, less insight into the conditions that governed the industry than did many competitors. From this view, it was not a management advantage, but rather organizational disadvantages in strategic planning that turned Hydro into the world's largest producer of fertilizer.

The findings show that the rational view of organizations in which organizational goals are clear, cause-effect relations are well understood, only partly explain Hydro's expansion. We have to add the cultural and the political perspective in order to understand the expansion process. The findings illustrate that HAE and HAI became two quite different

organizations -- with different cultures and different leadership styles. HAE was production oriented but faced integration problems. The subunits within HAE had rather different identities than a common, corporate identity. HAI was an organization with a common, positive identity -- created by a relational and emotional approach to leadership. This approach emphasized the pleasures of the leadership process rather than intentional action, driven by an evaluation of its consequences: "The head of the division created energy and excitement". That is, the management was characterized as a family, in witch the members had developet trust and good relationships. As a conclusion, within HAE, the development, over time, shows a process from diversity to unity, and within HAI the development shows how "diversity" and engagement created creativity. Within Hydro / Yara the development, over time, illustrates integration problems, but the findings also illustrate that the expansion process created resources and capabilities that later on became advantages:

- The company got a strong and efficient manufacturing base
- The company got a strong presence in every part of the world
- The company developed capabilities -- regarding development of good social relations and good customer relations
- The company developed an organizational culture that supported entrepreneurship associated with exploration, but also a culture that supported exploitation of existing accomplishments.

Yara's current organization and business – An overview[xii]

Mission – Strive for better yield:

- Yara's name comes from an old Viking term linked to harvest and yield, and the quest for "better yield" is the company mission. This mission reflects two key dimensions of Yara's ambition as a multinational company: Yara intends to deliver good returns for farmers and industrial customers, and returns that create satisfied owners.

Values - Yara intends to develop a result oriented performance culture based on:

- Ambition
- Trust
- Accountability
- Teamwork

Thus, Yara tries to develop an organizational culture that intends a combination of a "soft", collaborative leadership approach with a "hard" calculative leadership approach.

Goals for long-term value creation:

- Yara will strive to deliver on both short-term and long-term performance; i.e. the company will not sacrifice long-term performance for short-term payoffs and will not use long-term focus as an excuse for lack of short-term performance.

Thus, Yara tries to balance exploitation and exploration in order to adapt to demands and challenges. The company intends to make uncertain investments to create the possibility of more promising futures while, at the same time, the company intends to allocate resources to insure its survival in the face of short-run selection pressures.

Yara's strategic strengths are founded on:

- Global leadership in ammonia, nitrates, and balanced and specialty fertilizers
- An extensive global marketing network
- Technological innovation that spawns new industrial applications; i.e. exploration associated with search, discovery, novelty, experimentation, and innovation

Yara's business is organized in three segments:

- Upstream (production)
- Downstream (marketing and sales)
- Industrial

Yara's top management team has two regular meetings each month. Within these meetings knowledge related to strategic and operational questions is shared.

Figure 1 below, shows Yara's formal organizational structure. As a multinational company, Yara has a structure that is characterised more by power to local units than by corporate governance, reporting and control; i.e. the company has small central staffs compared to may other global companies.

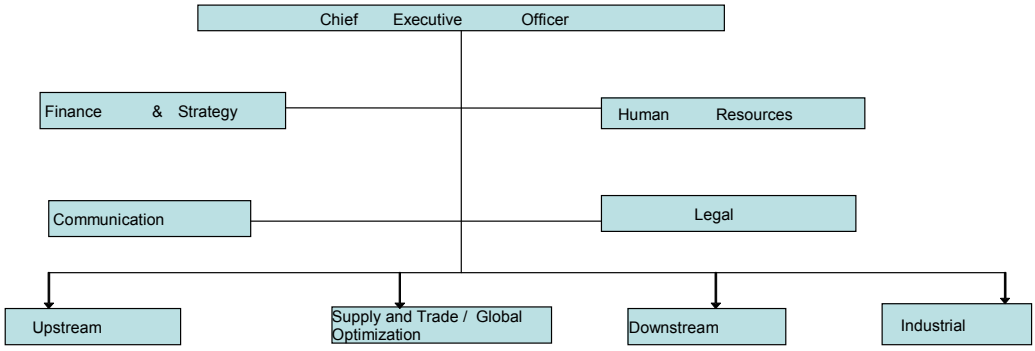


Figure 1: Yara's organization chart

The *Upstream* segment includes Yara's large-scale ammonia and fertilizer production plants, the backbone of Yara's production system, as well as the global trade of ammonia. Many of Yara's end-products[xiii] are directly or indirectly based on ammonia, for example ammonium nitrate in Europe, and urea (a simpler and less expensive type of fertilizer) largely exported to overseas markets.

Yara is the world's leading supplier of plant nutrients in the form of mineral fertilizers, and the company offers a full range of products and services through its unique sales and distribution network. Based on its position as the global number one in ammonia, nitrates and NPK, and with access to globally competitive low cost urea, Yara holds a strong position as a supplier to key grain producing markets. As leader in complex NPK for cash crops and the global number one in calcium nitrate and potassium nitrate speciality fertilizers, Yara is growing its position in value added markets producing cash crops like fruits, vegetables and flowers. After the acquisition of the Finnish fertilizer company, Kemira GrowHow[xiv] in 2007, Yara increased its global mineral fertilizer market share from six to seven[xv] percent. See the organization chart for the Upstream segment, Figure 2 below.

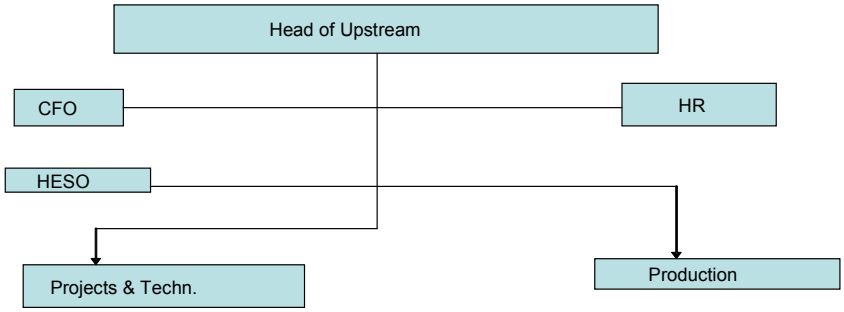


Figure 2: Organization chart – Upstream operations

The Upstream segment has a strong and efficient manufacturing base, with high utilization rates and economies of scale, and with a continuous focus on productivity improvements and simplification. In other words, the segment follows an exploitation strategy associated with refinement of production, improvement of organizational practices, implementation of knowledge, and reutilization. From this view, the segment's success factors are related to:

- Economies of scale
- Low-cost gas
- Simplification and productivity improvements
- Strong product portfolio

The Upstream management team has two regular meetings each month. At these meeting strategic and technical questions are discussed. The office for the Upstream operations is located in Oslo. The dominant Upstream operation is production, and the office for this operation (production plants) is located in Brussels. See the organization chart for Upstream production, Figure 3 below.

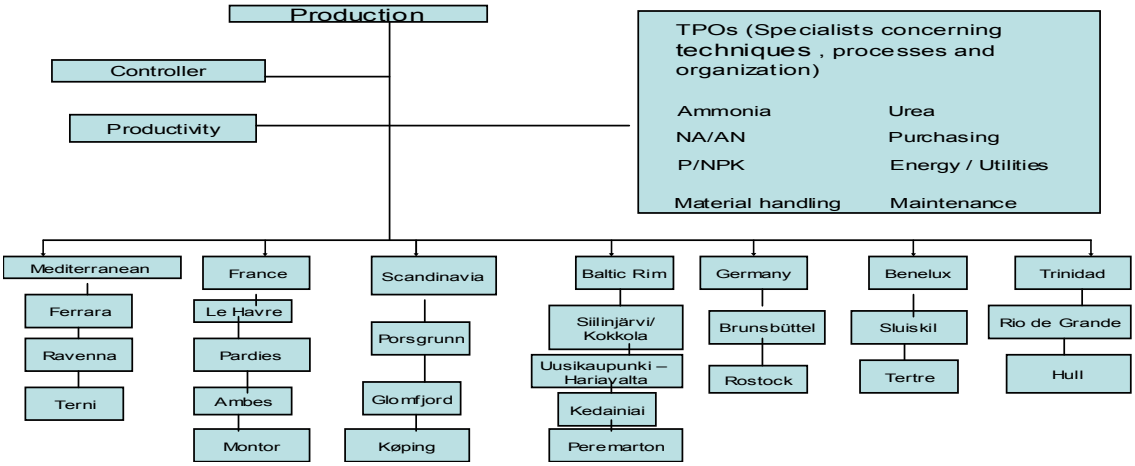


Figure 3: Organization chart - Upstream production

Upstream production produces products that are sold through Yara's Downstream and Industrial segments. The basic building block for these products is ammonia, and ammonia can be produced by using several different methods. All these methods are highly energy intensive, and fertilizer cost-related advantages are established largely through effective production of ammonia[xvi].

The head of Upstream production uses two mechanisms that are supposed to facilitate knowledge-sharing, learning, and development. The *first* is the TPOs (specialists concerning techniques, processes and organization) integrative roles or their roles as change agents that facilitate exchange, combination and exploitation of best practices within the organizational segment. The notion of learning from best practices includes the ways in which new ideas, techniques and routines come into vogue, gain credibility and come to govern activities. In the Upstream production case, this learning process is demand-driven. The head of the Upstream production has a continuous focus on technological and organizational improvements; i.e. the management formulates and communicates clear and concrete profitability and efficiency targets, follow an exploitation strategy, and evaluates the outcomes. From this perspective, the

TPOs gain legitimacy as change agents within a change-process in which they have capacity and capability to observe, evaluate, transfer, and implement new ideas. Thus, they transfer best practices from the best / most efficient plant to the other plants, and they assist the implantation of new techniques or routines. That is, the TPOs have an important *boundary spanning* role within the segment. The *second* mechanism is different types of meetings in which strategical and technological knowledge is shared.

- The Upstream management team (two meetings each month)
- Yara plant managers meetings (two meetings each year)
- Regional managers meetings (5-6 meetings each year)
- Plant managers meetings (3-4 meetings each year in each plant)
- Production forum (6-8 meetings each year)

The *Downstream* segment offers differentiated products and services to many different market segments, covering both commodity and high-value crop segments. Yara's downstream segment is unique in the fertilizer industry i.e. the combination of production and sales is unique and creates competitive advantages. The downstream segment has a strong presence in every part of the world -- in terms of a global sales and marketing networks across all continents with a physical presence in over 50 countries. See the organization chart for the Downstream segment, Figure 4 below. Thus, the worldwide marketing organization and sales infrastructure in all major regions enables optimization of fertilizer sales to prevailing market conditions and create success factors related to:

- Global presence through a unique sales and distribution network
- Local market knowledge
- Agronomic and application competence
- Differentiation and branding

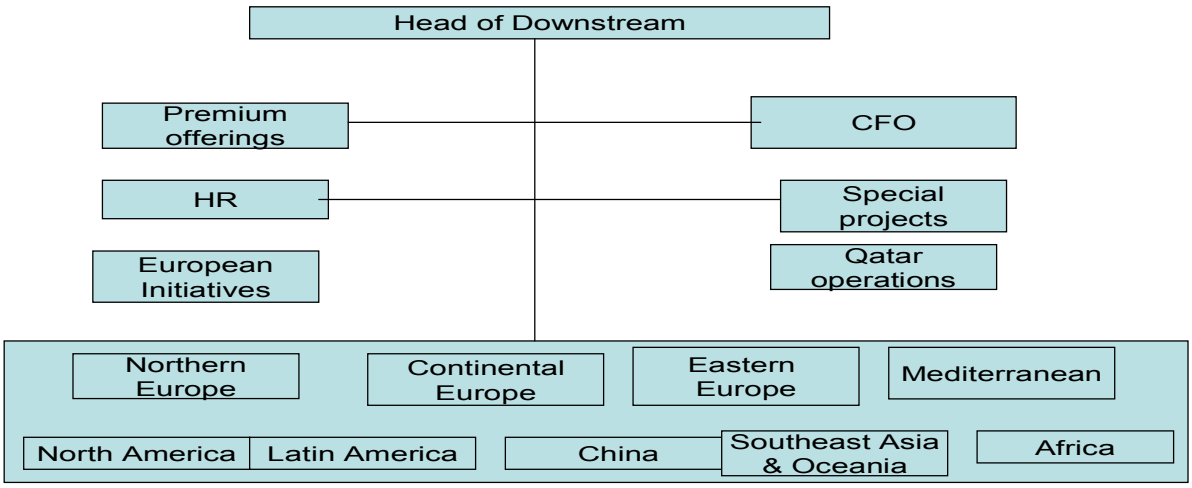


Figure 4: Organization chart – Downstream operations

The downstream operations take place in much more complex settings than the upstream operations. The Upstream segment has common, standardized technologies and organizational routines. The Downstream segment operates in many cultural and institutional contexts in which there are different codes and norms of appropriateness. The Downstream segment has common meetings for the managers, but there is a greater challenge within this segment to develop a shared system of meanings than within the Upstream segment -- in which the knowledge is related to clear goals, clear technology and routines. The downstream segment has different types of meetings in which knowledge related to market and sales is shared.

- The Downstream management team meetings (two meetings each month)
- Regional managers meetings (2-3 meetings each year)
- Meetings within the regions (2-3 meetings each year)

The *Industrial* segment creates value by developing and selling chemical products and industrial gases to non-fertilizer market segments. Nitrogen chemicals include urea and ammonia supplied to European chemical majors, as well as industrial explosives.

The product portfolio also includes industrial gases and CO_2 for the food and beverage industries. In addition, environmental applications are growing strongly, driven by new legislation in industrialized countries. Based on a strong production platform for nitrogen based products and its core competence in nitrogen chemistry, Yara is the number one supplier of CO_2 and nitrogen chemicals to selected industrial markets and applications in Europe. Yara is also the number one supplier of nitrates for industrial explosives. Thus, Yara's fertilizer production and R&D expertise have been combined to spur other business opportunities. See the organization chart for Industrial segment, Figure 5 below. The segment has a broad presence across the product value chain and has a wide and diversified customer base. The segment's success factors are related to:

- Product innovation
- Local market knowledge
- Differentiation and branding
- Technical competence

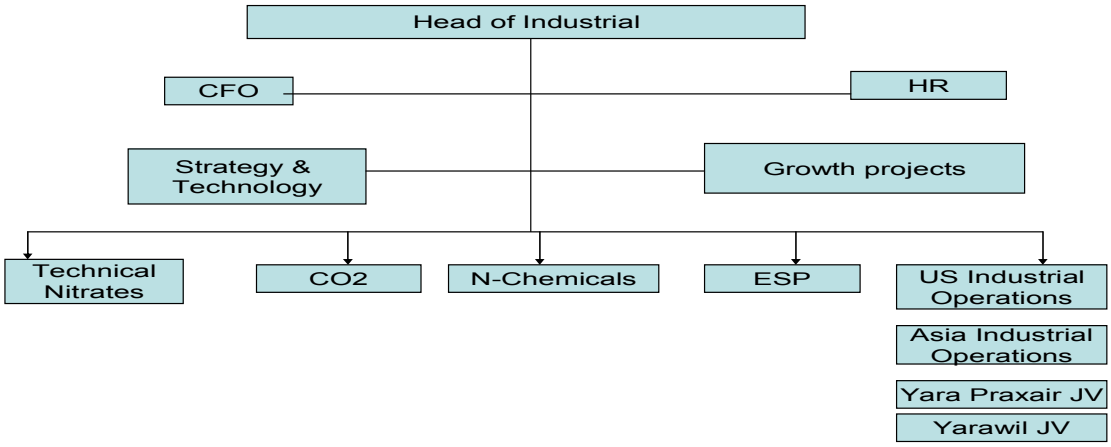


Figure 5: Organization Chart – Industrial operations

The Industrial segment has management team meetings (two meetings each month) in which knowledge related to products and market is shared.

The Upstream provides the manufacturing base for Yara's global business. The Downstream and Industrial segments are margin businesses, which provide additional and stable margins and reduce cyclicality in earnings. A knowledge margin is achieved through partnerships with key specialty fertilizer players and industrial partners. This enables Yara to combine local knowledge and customer relations with a comprehensive and differentiated product offering. Yara's global presence optimizes product flows to prevailing market conditions via its comprehensive local, regional and global market intelligence, combined with a geographically balanced production, storage and distribution network.

Global Optimization[xvii] (Supply and Trade)

Yara is in the business of producing and selling fertilizer and industrial products to customers all over the world. This business requires complex global optimization which has three main functions

- The supply of materials and energy to Yara's production sites and Yara's marketing and sales units in the different countries around the world
- Logistics for transporting Yara products to the market or to Yara production sites
- Planning and optimization of global supply and demand within Yara

The global optimization functions are taken care of centrally in Yara; i.e. Yara has a staff unit at it's headquarter in Oslo. The people who work in this unit have a level of responsibility for all Yara products. Thus, they are highly dependent on information, collaboration, and trust in order to satisfy Yara's (internal and external) customers, to make the most of Yara's resources and size through economy of scale, and to develop and maintain Yara's competitive edge. However, exchange and combination of information and cooperation are challenges in a global company in which there are many different arenas and many different interests (see

appendix 2). Global optimization means that Yara seeks organizational intelligence in the name of multiple organizational actors. However, the preferences or identities embraced by some of these actors might be inconsistent with the preferences or identities of other participants. What is intelligent action from the point of view of the head quarter might not be intelligent from the point of view of a sub unit. One example, the fact that sourcing and supply is taken care of centrally while the business impact is shown in the financial result locally (see appendix 2) may create tensions. Another example, the balance between centralization and decentralization challenges four components of elementary efficiency in organizations[xviii].

Arenas for exchange and combination of knowledge

Yara has arenas for exchange and combination of knowledge within and between the organizational segments in terms of meetings. These meetings were an outcome of an *igniting purpose* -- ignited through learning from the experience that had created an understanding of a need for meetings which could facilitate integration. Within the meetings the participants exchange and combine different types of knowledge:

- Explicit, technical knowledge -- related to production in the Upstream organization
- Explicit and tacit local market knowledge -- related to the Downstream and Industrial segments
- Explicit and tacit global optimization knowledge
- Explicit and tacit regional trade knowledge -- related to Downstream
- Knowledge about production capacity and market demands -- related to strategic decisions
- Explicit and tacit political and cultural understanding
- Knowledge about new demands and new challenges

Knowledge sharing in Yara is a vertical (top down / bottom up) and a horizontal process. However, there seems to be room for improvements regarding:

- Exchange of knowledge between Downstream and Industrial
- Exchange of knowledge between Upstream and Downstream
- Combination of knowledge about new challenges and existing knowledge about market and products
- Combination of market knowledge and knowledge regarding production

That is, there seems to a need for increased exchange and combination of knowledge in ways that facilitate balancing exploitation and exploration or a balancing refinement of existing knowledge and techniques and a development of new knowledge and techniques.

Meetings are an important type of arena for knowledge-sharing, and management development is another important arena. From this perspective, Yara has launched a new management development program, LEAD[xix], aimed to improve the company's performance by cultivating better leaders. The LEAD program is an arena for knowledge-sharing concerning Yara's leadership, culture, and organization: "Leadership is a key part of the ways in which Yara is coordinated and controlled to optimize performance, and management development is a key element in this strategic approach"…. "Leaders are evaluated in terms of their contribution to outcomes, and development is primarily about building the capability of leaders in order to achieve our strategic objectives"…. "Management development is a key element of the ways to avoid the problems of diversity through socialization, inspiration, and commitment to mould multiple talents and background into a common culture"…. "It is a goal to teach leaders to act consequentially, related to achievement of our objectives, and to teach them to act appropriately, related to identities that resided in our values." From this perspective, LEAD intends to transfer knowledge about:

- Yara's cultural values and demands
- Yara's strategy and organization
- Yara's leadership demands / leadership competencies

- Different leadership contexts in Yara

Thus, LEAD may develop the cognitive dimension of social capital -- related to shared interpretations and systems of meaning, and shared language and codes to enable communication and knowledge-sharing.

Challenges regarding knowledge-sharing in Yara

In everything from problem solving to personal politics to strategy and to ideologies, Yara's management has to make trade-offs between:

- Integration and variety
- Unity and diversity
- Equality and differentiation
- Exploitation and exploration

Our findings (based on interviews conducted with 10 key informants) suggest that there are different opinions and meanings about trades-offs regarding these issues That is, our key informants do not agree about what a "right" combination of integration and variety, integration and variety, unity and diversity, equality and differentiation, and exploitation and exploration is or should be. Agreement is a nice word, but agreement about appropriate trade-offs can be very difficult to achieve. We do not claim that it is possible to define optimal trade-offs, but we do claim that arenas that focus on strategic issues, should create freedom, room and opportunities for a dialogue that addresses questions related to these issues. Both differences and disagreement in such a dialogue are important for constructive controversy. Constructive controversy is good for progress and discovery, but it requires development of the relational aspects of social capital. That is, differences of opinion themselves do not promote understanding and learning; controversy must be well-managed to be constructive.

Integration[xx] *and variety*

The integration of activities carried out by the different international units of a multinational corporation has been frequently mentioned as one key strategic requirement, arising from the increasing globalization of most industries. At the same time, however, responsiveness towards the special characteristics of local markets appear to be beneficial in order to meet the increasing demands of local governments, as well as different tastes or intrinsic markets. In many industries, firms are advised to try to satisfy both requirements simultaneously (Bartlett and Ghoshal, 1987). However, it is difficult to find and maintain a proper balance between organizational integration and sub-unit autonomy. On the one hand, the attempt to coordinate and to make coherence may tend to foster efforts to protect the identity and distinct character of sub units. On the other hand, variety associated with poor firm performance may generate demands for coordination, control, coherence and consistency. During the last few years, Yara has increased integration, but the company is still characterized as an organization with relatively high sub-unit autonomy. This is especially so in the Downstream segment.

In order to increase integration, Yara uses several techniques. The most important are on–the-job training and job rotation[xxi]. Another is speech and communications[xxii] -- related to top managers' participation in strategy meetings, seminars and management development programs -- where the top management has an important role in signature processes in which a development from the heritage and the values of Yara is started. A third technique is meetings in which exchange of ideas, experience, and knowledge take place. A fourth technique is the development of a corporate identity[xxiii] by means of:

- Corporate logo[xxiv]
- Corporate communication (responsibility to the society, environmental impact, product stewardship, corporate directives, shareholder policy, HESQ policy, etc.)
- Corporate behaviour (values and norms related to ambition, trust, accountability, teamwork)
- LEAD

Integration is associated with efficiency and effectiveness, but integration also means increased interdependence. This may create problems in case of organizational change. The closer a number of organizational components are integrated, the more changes in one have implications for the others. Today, change and flexibility are organizational requirements. From this point of view, "de-coupling" or keeping activities apart might be an organizational advantage.

Unity and diversity[xxv]

All organizations face the questions of how much and what forms of unity the sub-units can tolerate and how much and what forms of diversity the organization can tolerate. Unity is associated with clarity and agreement about values, logics, objectives, plans, responsibility, accountability, routines, and behavioural rules; i.e. unity is related to stability, order, control, and predictability. Unity also implies agreement concerning how routines, behavioural rules are explained and justified, with a common vocabulary, expectations and success criteria. Diversity is associated with complimentary logics, mindsets, skills and capabilities. From a diversity perspective, organizations might be seen as collections of individuals and groups often having quite diverse attitudes, backgrounds, aspirations, training, identities, experiences, social ties, and styles. However, diversity is also associated with resources which are related to creativity, innovation, flexibility and adaptability.

Yara tries to balance unity and diversity[xxvi]. On the one hand, it is agued that "to make the most of our assets, we all need to pull in the same direction, armed with right competence and appropriate mindset. Our four values – ambition, trust, accountability and teamwork will guide us in this." On the other hand, it is argued: "Yara's philosophy on diversity springs from both our social and business beliefs. With a presence on all continents, we consider diversity to be crucial for our development and future competitiveness…. Diversity makes

good business sense. We believe in securing complimentary skills and mindsets, and to taking key factors such as gender, nationality, age, education and experience into the mix to build dynamic teams…. We believe that a diverse workforce creates a richer working environment, provides the wider stimuli that result in creativity, and produces better leadership."

Concerning unity, in terms of routines and behavioural rules, Yara's Upstream segment is more standardized and coherent than the Downstream segment. This finding has implications for experiential learning and improvement. In the Upstream segment, experiences, in terms of best practices, are routinely coded into rules, principles, and systems -- in ways that intend to increase efficiency and effectiveness. The Downstream segment is a much more fragmented or loosely coupled system, in which competing rules of appropriateness might be maintained over long time periods due to their separateness. From this view, as long as local rule-following meets locally defined targets and aspiration-levels, local, appropriate rules are unlikely to be challenged, even if they are not in any sense "optimal." However, it is argued that reduced slack resources may call attention to inconsistencies in rules, and produce demands for coordination and consistency across groups and units. Increased comparison across segmented groups or units with different cultural traditions, rules of appropriateness and taken-for-granted beliefs, may also trigger processes of reconciliation. Increased bench-making might do the same.

Yara faces dilemmas regarding unity and diversity. These are dilemmas between cost efficiency, simplicity, acceptance in local units for driving productivity in all parts of the organization on the one hand, and on the other hand, focus on corporate governance, reporting and control. These dilemmas are reflected in Yara's global optimization.

Equality and differentiation

Equality is associated with consensus, conflict avoidance, low power distance and cooperation as a norm. Differentiation is associated with individualism, self-interest, pay-performance and moderate power distance.

From an equality perspective it is argued that Yara is a company that is impregnated by Norwegian values and mindsets (See Hofstede and Hofstede, 2005 regarding Norwegian organizational values). That is, Yara has a dominant leadership style that aligns to a social partnership approach to leadership, or aligns with claims that emphasize consensus, participation, belonging, and cooperation as a norm[xxvii]. From a social partnership approach, a leader has a cooperative mindset and follows a rule of the game that is associated with mutual trust, dialogue, and transparent strategies; and this leader interacts with other leaders who follow the same rule. They are committed to norms, duties, and obligations and are supposed to use their discretional power accordingly. In these ways, related leaders may interrelate heedfully, creating and communicating a culture of partnership in which cooperators are viewed as core assets – associated with creativity, innovation, and learning. When leaders act according to the social partner approach, human groups and networks are assumed to persist and thrive because within them competition among cooperators is suppressed by shared rules.

However, Yara is increasingly operating in a global context which values competitiveness and individualism (Ferraro et al., 2005). These organizational aspects are associated with a view which sees organizational activities as organized by exchange among calculating, self-interested agents. That is, relationships are governed by functional contracts, and the feeling of human bonding, trust, loyalty, and belonging is seen as hindering the mechanism of free exchange.

It is argued that Yara's pay and performance management should align with Yara's corporate strategy, or there should be a standardization of human resource policies and a closer synchronization of these activities with the overall business strategy through efficient reward systems. Some of the informants (mostly not Norwegian) argue that "leaders in higher degree should be compensated in terms of their contribution to organizational outcomes." Thus, they assume that pay and performance management is the trigger that engenders a sense of motivation and commitment, which in term leads to improvement in performance. Yara is partly guided by this assumption. The company tries to combine a collaborative and a calculative approach to leadership. On the one hand, Yare emphasises trust and teamwork, and on the other hand, the company emphasises ambition, accountability, and performance-orientation. That is, Yara tries to create a culture in which both self-interested, utility maximizing actors and rule followers with an ethos of self-discipline, impartiality and integrity are supposed to collaborate. However, it is very difficult to develop and maintain such a culture.

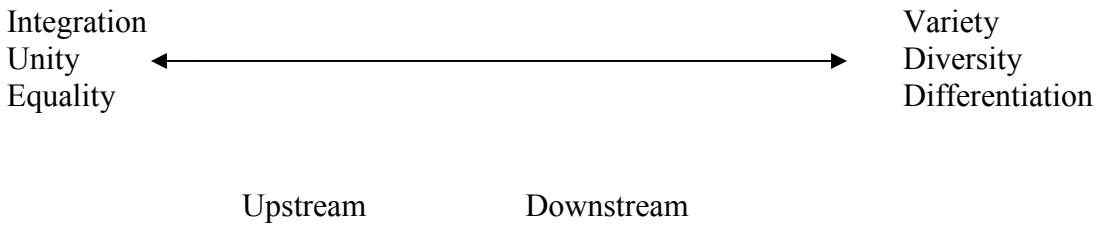
Exploitation and exploration

Any kind of long-term adaptive process requires a balance between exploitation and exploration (March, 1991). Exploitation is associated with improving organizational practices that are already known. That is, learning from experience is used to improve acting, modify organizational routines, and increase efficiency. However, if learning actors engage in such additive learning alone, they might find themselves trapped in some sub-optimal state and fail to discover the intelligence of a new idea or to develop competence in it. Exploration is associated with the changing of a mindset that is known and experimentation with what is not known but might become known. That is, learning from one's own experience and the experience of others are used to challenge existing perspectives, routines, and practices and to

develop new perspectives on the future. However, if learning actors engage in such developmental learning alone, they might find themselves trapped in some sub-optimal state, failing to stick to a new idea long enough to determine its true value or failing to gain the full benefits of mastering practices related to the idea. Therefore, balancing[xxviii] is needed to manage the need for certainty, consistency, and efficiency on the one hand, and the necessity of experimentation, progress, and adaptableness on the other hand[xxix]. Many of the key informants were highly concerned about the balance between exploitation and exploration, and they argue that questions related to this balance should be addressed in meetings which concern strategic issues: "There is a tension between the refinement of existing knowledge and methods and the development of possible new directions"…. "On the one hand, we need networks that thrive on easy communication, and such networks thrive on unified understandings. Consensus on the fundamentals is essential…. On the other hand, we need to examine new possibilities, many of them dubious. This activity thrives on diversity and deviance."

Summary

Our findings indicate that the key informants have different interpretations and understanding of important leadership and organizational issues within Yara. These differences are most significant between the Upstream segment and the Downstream segment, see the illustration below.



From this perspective, differences in logics or mindsets might impact communication and knowledge sharing across organizational segments, functions, and units located in Yara's various cultural contexts. That is, the differences might affect the development of social capital.

The future -- regarding developing the structural, cognitive and relational dimensions of social capital in ways that facilitate exchange and combination of knowledge across business units

A route for exchange and combination of knowledge in multinational companies might involve developing the structural, cognitive and social dimensions of social capital. This would mean further embedding the strategy of common leadership principles as well as further developing leaders. It would also mean addressing current business units' self-centeredness that is the product of there being disincentives to engage in knowledge-sharing. Another condition would be putting in place culturally adept, geographically mobile global leaders who have the ability to act as boundary spanners across a group of locally embedded business units and who can act as ambassadors on behalf of common igniting purpose and as disseminators of PR.

There are important differences between the Upstream - and the Downstream segment regarding cooperative mindset and boundary spanning. The Upstream segment intends to develop good social relationships boundary spanning within the segment. The much more complex Downstream segment intends to develop good social relationships within the segments but also between the segment and external actors (customers, etc.). Within the Upstream segment all the three dimensions of social capital seem to be relatively well developed, but it is a type of social capital that rather facilitates refinement of existing knowledge and techniques than facilitates development of new knowledge; i.e. the focus is on

exploitation rather than on exploration. Within the Downstream segment social capital in terms of meeting, common beliefs and a cooperative mindset are not so well developed.

The description and the analysis of Yara are based on the assumption that values, norms, and beliefs that evolve at the very earliest stages of an organization's development might thereafter continue to drive, shape and guide behaviour -- related to strategy, knowledge-sharing, etc. This assumption suggests that knowledge related to efficient production rather than knowledge related to marketing and sales still forms premises for strategic decisions in the company. From this view, Yara uses management development as means to solve the tension between existing norms and beliefs and new perspectives that may challenge or contradict the existing norms and beliefs.

The new LEAD program intends to develop leaders who have a corporate identity -- associated with Yara's global growth strategy. From this perspective, LEAD is supposed to be an arena that facilitates knowledge-sharing[xxx] related to:

- leaders personal development
- development of leadership competencies and capabilities
- development of shared values and norms

Thus, LEAD focuses on knowledge associated with management, but LEAD does not seem to be an arena that facilitates exchange and combination of technical knowledge associated with production and sales.

Leadership is generally seen as a force for coherence in organizations, as contributing to effective organizational action by eliminating contradictions and preventing confusion. From this view, the LEAD program emphasizes ways to avoid the problems of diversity through recruitment practices, through the use of persuasion, bargaining, incentives, socialisation, and inspiration to mould multiple talents and background into a common

leadership culture. This vision of leadership as forging a unity of harmonious purpose and commitment clashes, however, with an alternative vision of leadership as stimulating and nurturing diversity as a source of organizational strength. From this view, LEAD might be a program that contributes to unity rather than to diversity. The selection of candidates to the LEAD program, through an assessment procedure, points in the same direction.

This paper makes an argument for balancing unity and diversity. Leaders might learn within a perspective, but they also might explore other perspectives and learn new information, ideas and reasoning. Then they integrate diverse ideas preciously considered incompatible to create new solutions. These dynamics can very much stimulate organizational progress as well as individual learning.

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EFMA. European Fertilizers Manufacturers Association. http://www.efma.org/Statistics/Index.

http://faostat.fao.org/

Interviews

We gratefully acknowledge the generous way in which each of the following contributed their time and insight the interviews.

Ed Cavazuti	Senior Vice President	Head of Downstream
Tor Holba	"	Head of Upstream
Terje Bakken	"	Head of Industrials
Jan Duerloo		Head of Production
Joel Molet	Vice President	Head of Sales and Trade Africa
Francois Servantie	Vice President France	Head of Production France
Jean-Michel Tiards		
Steinar Svendsen		Production
Sigbjørn Engebretsen		HR
Almar Kylling		Production

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[i] The report is based on written sources (books about Hydro's / Yara's history, Annual reports, Financial Review 2007, about Yara on the internet), and semi-structured (tape-recorded 1, 5 hours) interviews conducted with 10 relevant key informants.

[ii] Key informants describe this organizational change as liberation – Yara had been a part of "a bureaucratic system" and became a free and independent organization. That is, Yara became a company with small central staffs and with a top management which had discretional power.

[iii] Kristian Birkeland was professor of physics at the University of Christiania (now Oslo). But he wasn't just an academic, as is clearly evident from his work as an inventor. Samuel Eyde had studied engineering in Germany, and later on he established himself in Norway as an entrepreneur who took on several large industrial projects. Marcus Wallenberg was head of the Swedish Wallenberg family -- a family engaged for several generations in banking and industrial development in Sweden, Scandinavia and Europe.

[iv] Hydro's production of mineral fertilizer was based on the Birkeland / Eyde method. This method was very energy intensive, and in 1929 Hydro adopted the much more cost efficient Haber/Bosch process. Through this adaptation, the German concern IG Farben purchased 25 percent of Hydro's shares. IG Farben also assumed responsibility for the marketing of Hydro's fertilizer products outside Norway. However, Hydro was allowed to export directly to the important Danish market. The collaboration with IG Farben lasted to 1945.

[v] Hydro / Yara's historical description is based on: Books / articles about Hydro's / Yara's history*;* about Yara on the internet; annual reports; information from the key informants.

[vi] After the Second World War, Hydro Agri had to re-establish its marketing network which largely had dismantled during nearly twenty years of German dominance. As one of several suppliers to the IG Farben international sales organization, Hydro had been forced to reduce its sales network to one single office in Copenhagen. As a first step in the re-establishment of a marketing network, Hydro did set up sales offices in Sweden, the US, Egypt, and Spain.

[vii] Hydro exported technology. This export increased production capacity and thereby increased the global competition, but it also created opportunities for research and technological development. Hydro could use this knowledge when in 1967 the company built a new production facility in Porsgrunn.

[viii] The Qafco 5 project includes the construction of two ammonia plants, with a total daily production capacity of 4,600 tons, and a urea plant with a total daily production capacity of 3,850 tons. The project also includes upgrades of already existing facilities and infrastructure that will facilitate future expansion.

[ix] In Norway Hydro operated three production facilities for fertilizer, two small and one large. The largest; Hydro Porsgrunn, was among Western Europe's most cost-effective ammonia plants. However, cost-effective production of ammonia depends on access to low cost natural gas. Yara Upstream's plants in Qatar and Trinidad are strategically located in terms of access to low cost natural gas and proximity to growth markets in Latin America and Asia.

[x] Hydro's oil and gas activities in percent of Hydro's total operating profit: 1980: 77%, 1982: 76%; 1984: 70%, 1986: 83% (Hydro' annual reports).

[xi] Particular in the years 1983-1985, Hydro evidently judged that the company could expand strongly on the continent and that market conditions would remain as before. In a large strategic plan in early 1986, just before the substantial price drop, the management thought that such price fall would not occur.

[xii] Background information about Yara's organization and business builds on: *YARA 1905 – 2005: 100 Years Young,* and information about Yara's business and organization on internet.

[xiii] Yara's (Hydro's) flagship has been a compound fertilizer called NPK -- a rich composition that contains not only nitrogen, but also phosphorous and potassium. This is one of the most highly refined types of fertilizer but also one of the most expensive.

[xiv] Alongside Hydro, the Finnish company Kemira had grown through direct investments in Europe in the 1980s. Initially, Kemira did not belong among the major companies, and it expanded from being a national company to a European concern.

[xv] There are a large number of smaller producers. The main difference between Yara and the other producers is that Yara has a strong sales and marketing presence in every part of the world.

[xvi] Hydro's strategic advantage was access to hydropower in the production of mineral fertilizer. However, energy from hydropower gradually lost in competition with energy from low cost natural gas. The production of ammonia, the building block in the fertilizer, is today based on low cost natural gas. The cost of natural gas accounts for as much as 70-90% of the total cash cost of ammonia production.

[xvii] Global optimization is the task of finding the best set of parameters to optimize an objective function. In general, there can solutions that are locally optimal but not globally optimal. Consequently, global optimization problems are typically quite difficult to solve.

[xviii] A first component of elementary efficiency in organizations is *competence*. Organizations work well if the members know what they are doing (such knowing requires information). A second component is *initiative*. Organizations work well if problems are attended to most of the time locally and promptly. A third component is *identification*. Organizations work well if people in them take pride in their work. A last component is *unobtrusive coordination*. Organizations work well when the actions of individuals are coordinated quickly and inexpensively (March, 1999). Too much centralization might have negative effects upon the components.

[xix] Yara's Leadership Assessment and Development program (LEAD) intends to identify and develop leaders with high leadership potential.

Many of the key informants argue that line managers should make the final decision regarding selection of candidates to this program.

LEAD is supposed to be beneficial for the individual leader as well as for the company.

- LEAD will give leaders better insight into their own leadership strengths and future development needs
- LEAD will strengthen Yara's leadership competencies and capabilities – which are crucial for Yara's growth strategy.

(http://www.yara.com/library/attachments/en/LEAD_eng.pdf).

[xx] Integration is a process which turns previous separated units into components of a relatively coherent and consistent system. There are several types of integration (March, 1999: 134-135). *Functional integration* is a measure of interdependence and relevance; i.e. the degree to which decisions and events in one part of a system has an immediate and direct impact on other parts. *Social integration* refers to connectedness and measures of linkages, such as contact, communication and training. *Cultural integration* implies that the beliefs of a social group fit together and make sense. *Integration as an organization* or as an institution refers to: a) Structures, rules, roles and practices specifying legitimate authority relations and codes of appropriate behaviours; b) Shared purposes, identities, traditions of interpretation and principles of legitimacy that explain and justify practices and provide a basis for activating moral and emotional allegiances and solidarity; c) Common resources which create capability and capacity to act in a coordinate way.

Integration is associated with coordination, and the literature makes a distinction between formal and social coordination mechanisms (March and Simon 1958, Galbraith, 1973). The formal mechanisms are: Centralization (of power), formalization (of rules and routines), goal-setting, planning, output control, and behavioural control. The social mechanisms are: Lateral relations across the vertical structure (meetings, direct contact among managers of different departments, networks), job rotation, task forces, teams, integrative roles, and common values and norms.

[xxi] All key informants emphasized job rotation as an important mechanism. It is an approach to a) management development -- where a leader is moved through a schedule of assignments designed to give him or her a breadth of exposure to the entire operation (promotability); b) allow qualified employees to gain more insights into the

different processes of the company and to increase job satisfaction through job variation (skill enhancement); and to c) increase integration. However, it is pointed out that job rotation can be problematic (A professional oriented person might not like to be or want to be a leader (i.e. rotation is not a good thing for them); senior managers might be unwilling to risk instability in their units by moving qualified people from jobs where the lower level manager is being successful and reflecting positively on the actions of the senior manager).

[xxii] Speech and communication can be described as signature processes where the top management brings out Yara's values and norms in order to create shared understanding and commitment.

[xxiii] Yara intends to be a company that embodies ethical and social values which are supposed to constitute Yara's corporate identity. Messages about commitment to corporate ethical and social responsibilities are likely to evoke strong and often positive reactions among stakeholders (Fombrun and van Riel, 2004).

[xxiv] Yara retained the Viking Ship logo, which had represented Hydro's fertilizer brands for 100 years.

[xxv] Diversity forms an almost universal aspiration when it comes to drafting a firm's corporate mission statement. Look at any corporate website or annual report these days and it will almost inevitably contain the ubiquitous eulogy to the benefit of diversity in terms of creativity, innovation and learning. From this perspective, diversity is associated with trust and openness, but diversity might also be associated with self-interest, opportunism, uncertainty, and conflict.

Diversity in knowledge, competencies and capabilities might be combined in a way that creates "absorptive capacity" (Cohen and Levinthal, 1990). That is, absorptive capacity is a strategy for improving the capabilities for learning from others. Without this capability a company can not discover what is going on within fields related to R&D.

A company might operate within two types of stable industry equilibria. One equilibrium is characterized by low investment in R&D, low rate of discovery, and low rate of copying. In this equilibrium there are no incentives for any firm to engage in R&D because the main payoff from R&D is not the return to one's own inventions but the return from copying other firms' inventions. Since no one is interested in R&D, there are no inventions to be copied, and no reason for any firm to invest in R&D. The other equilibrium is characterized by high investment in R&D, a high rate of discovery, and a high rate of copying. There is no incentive for any firm to decrease investment in R&D, because the investment is required to take advantage of the inventions that are produced within the industry. R&D is sustained not by the initial inventions in produces – which may too infrequent to justify the investment – but by the capabilities for utilizing inventions it develops. Yara is a firm that intends to operate within the latter equilibrium.

Many organizational actors are advocates of diversity and decentralization. However, over the past decade, a strand of literature proposes that, as a result of globalization and institutional change, different businesses are superseded by universally applicable techniques. Current debates regarding change stress the impact of globalization, incorporating cultures, institutions and firm-level practices as a force of convergence (Scott and Davis, 2007). This argument is reinforced by a growing focus on shareholder value and the erosion of corporate relationships (Hunt, 2000). Furthermore, spreading and internalizing of best practices through diffusion of benchmarking, are also seen as a key factor in the process (Geppert et al., 2002).

[xxvi] Yara 1905 – 2005: 100 years young, p. 5;
http://www.yara.com/en/sustaining_growth/employees_matter/diversity/index.html

[xxvii] "Cooperation as a norm" is attached to Johan B. Holte who was Hydro's managing director from 1967 to 1977. Johan B. Holte, holds a central position in Norwegian post-war industrial history, and it was under his leadership that Hydro became a modern company. Johan B. Holte is described as a dynamic and visionary leader. Many consider Holte's greatest achievement to be the part he played in modernizing the company's organization and establishing collaboration. In this process, Holte got rid of the class symbols in the company, and the distance between top management and the workers became significantly lessened.

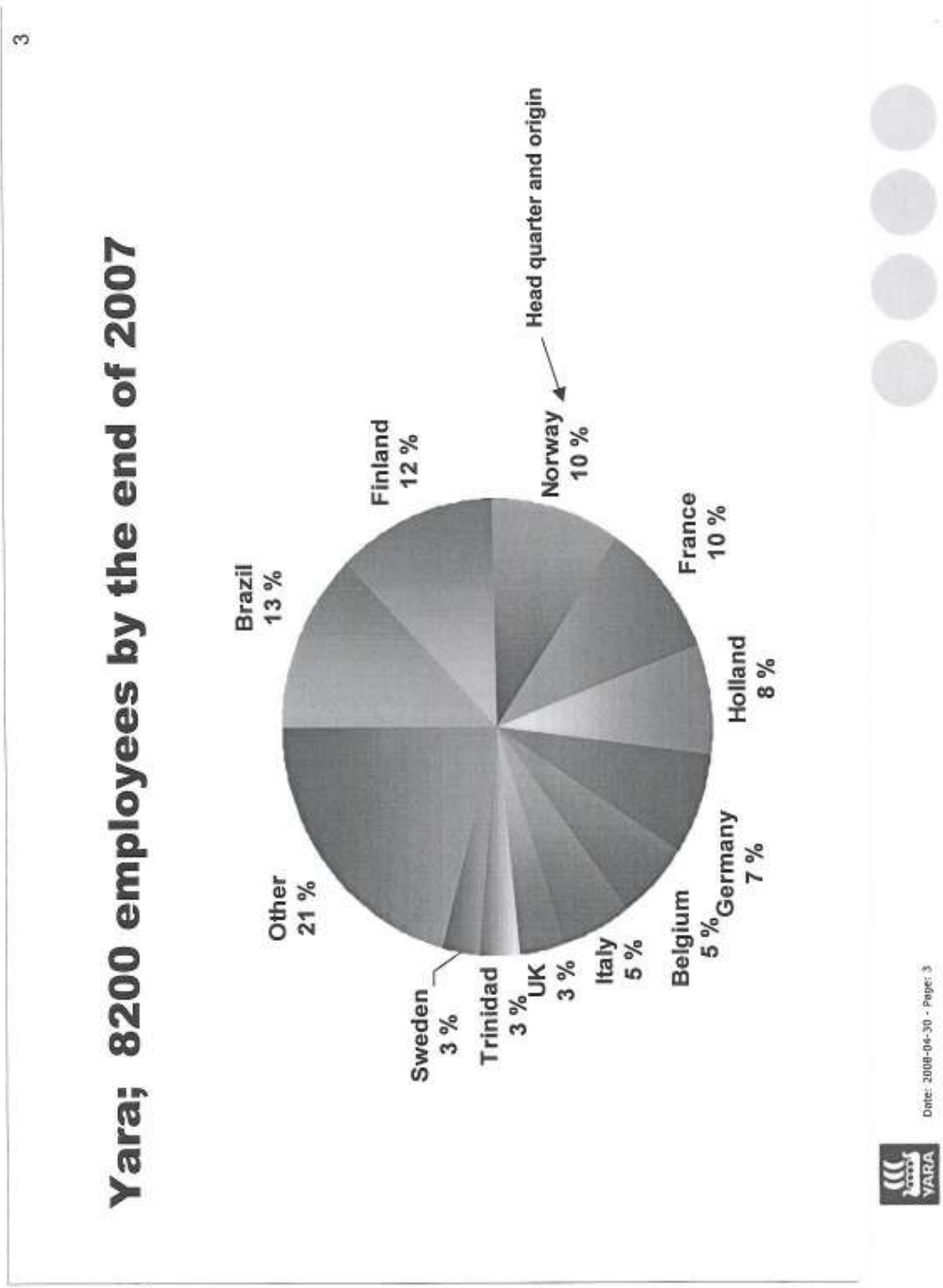
[xxviii] It is extremely difficult to develop and to maintain a balance between exploitation and exploration. A productive balance might be threatened by two dynamics. The first involves accelerating attention to search for clarity and refinement of goals, techniques, routines, etc. This dynamic is associated with tight networks. Such networks thrive on easy communication, and communication thrives on unified understanding. The second

dynamic involves accelerating attention to creativity and innovation. This dynamic is associated with loose coupled networks. Such networks thrive on diversity and deviance.

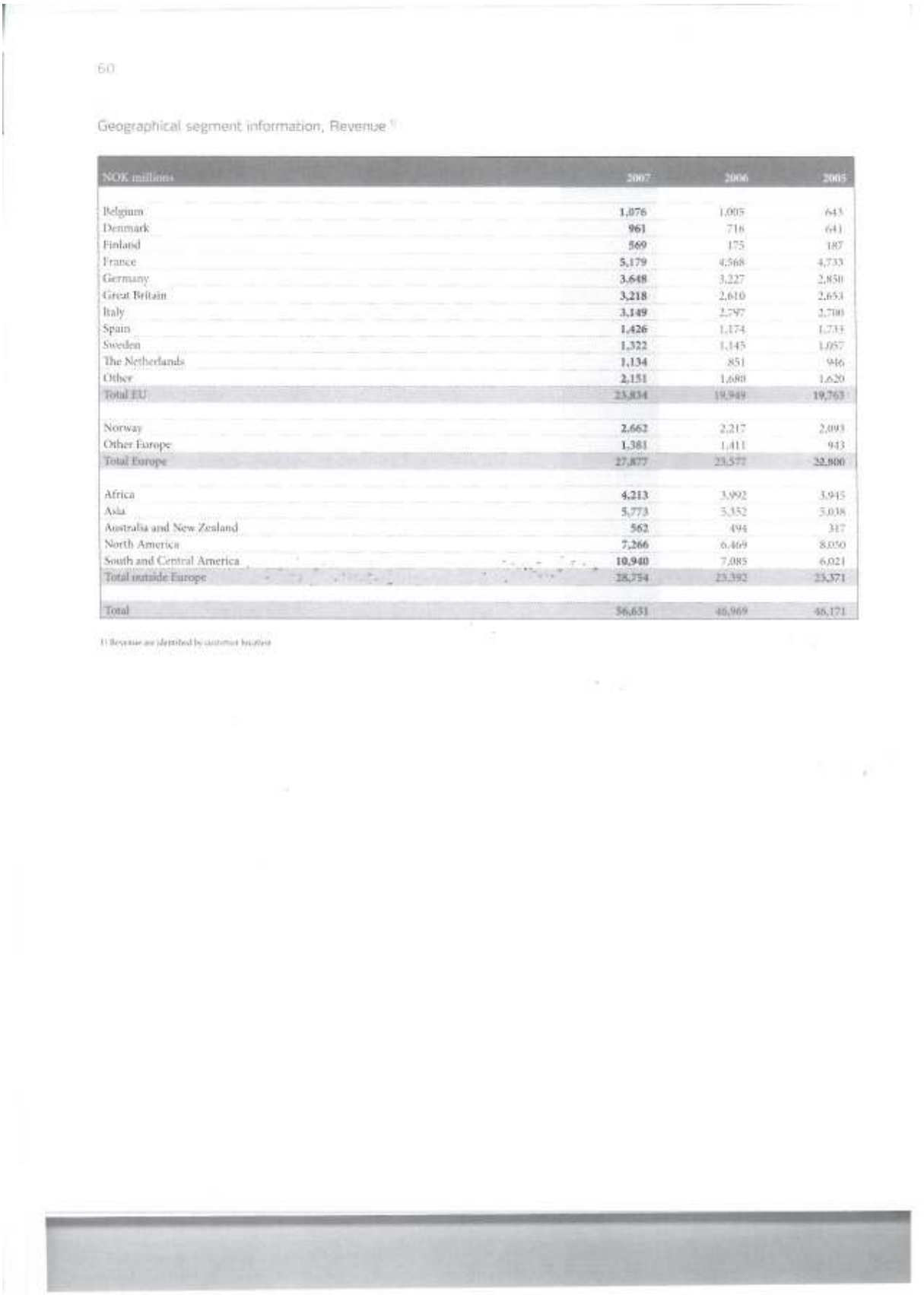
[xxix] Yara's strives to deliver on both short-term and long-term performance illustrates the need for balancing exploitation and exploration. The Hydro / Yara history also exemplifies this need, but the history also shows the difficulties of balancing. One example was the technological challenges related to the change from the Birkeland / Eyde method to the Haber Bosch method. Another example is related to Johan B, Holte's role in the modernization of Hydro's organization. This modernization challenged Hydro's traditional power-based leadership style by introducing cooperation as a norm, but this norm is today challenged by a leadership style which emphasizes competitiveness and individualism. A third example is Hydro's redefining of the rules of the game that constituted the interaction among fertilizer producers in the Western European market.

[xxx] Leadership development and training might facilitate formal and informal interaction and the development of networks in which the transfer of knowledge occurs. However, the beneficial effects of a network need to be qualified. The socio-institutional heritage of different countries may exert a strong influence on the way such networks operate.

Appendix 1


3
Yara; 8200 employees by the end of 2007
Head quarter and origin
Norway 10 %
France 10 %
Holland 8 %
Germany 7 %
Belgium 5 %
Italy 5 %
UK 3 %
Trinidad 3 %
Sweden 3 %
Other 21 %
Brazil 13 %
Finland 12 %
YARA
Date: 2008-04-30 - Page: 3

Appendix 2



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Geographical segment information, Revenue [1]

NOK millions	2007	2006	2005
Belgium	1,076	1,005	643
Denmark	961	716	641
Finland	569	175	187
France	5,179	4,568	4,733
Germany	3,648	3,227	2,850
Great Britain	3,218	2,610	2,653
Italy	3,149	2,797	2,700
Spain	1,426	1,174	1,733
Sweden	1,322	1,145	1,057
The Netherlands	1,134	851	946
Other	2,151	1,680	1,620
Total EU	23,834	19,949	19,763
Norway	2,662	2,217	2,093
Other Europe	1,381	1,411	943
Total Europe	27,877	23,577	22,800
Africa	4,213	3,992	3,945
Asia	5,773	5,352	5,038
Australia and New Zealand	562	494	317
North America	7,266	6,469	8,050
South and Central America	10,940	7,085	6,021
Total outside Europe	28,754	23,392	23,371
Total	56,631	46,969	46,171

[1] Revenue are identified by customer location