

Aggregates & Concrete

Aggregates and concrete, like cement, are key components of the building industry. Based on internal and external analyses, in 2009 Lafarge is the second world producer of aggregates and the third world producer of ready-mix concrete. At December 31, 2009, we have production facilities and sales offices in 36 countries. In the year ended December 31, 2009, our consolidated businesses operated 597 aggregates quarries, which sold approximately 196 million tonnes of aggregates, and 1,176 concrete plants, which sold approximately 37 million m³ of concrete. We also produce asphalt and pre-cast concrete products and provide road contracting and surfacing services.

We are vertically integrated to varying degrees with our Cement Division which supplies substantial volumes of cement to our concrete operations in several markets. Also within our Aggregates & Concrete Division, our aggregates operations supply a substantial volume of aggregates required for our concrete, asphalt and paving operations.

Products

AGGREGATES

Aggregates are used as raw materials for concrete, masonry, asphalt and other industrial processes, and as base materials for roads, landfills and buildings. The primary aggregates we produce and sell are hard rock (usually limestone and granite), but

we also produce natural sand and gravel. Additionally, depending on the market, we process and sell recycled asphalt and concrete. Aggregates differ in their physical and chemical properties, granularity and hardness. Local geology determines the type of aggregates available in a given market, and not all types of aggregates are available in every market. Through our research and development (Lafarge Research Center, LRC) we have greatly increased our understanding of the impact that the various properties of aggregates have in their final applications. Consequently, we have been able to refine our product offerings and step up innovation in our downstream products.

See Section 3.9 (Innovation, Research & Development) for more information on the R&D in the Group.

CONCRETE

Concrete is a mix of aggregates, cement, admixtures and water that hardens to form the world's most used building material. We produce and sell a wide range of concrete and masonry mixes to meet our customers' diverse needs. Tensile strength, resistance to pressure, durability, set times, ease of placing, aesthetics, workability under various weather and construction conditions are but a few of the characteristics that our customers consider when buying concrete. From the very basic to the cutting edge, we offer a broad range of concrete mixes.

Through our internal Research center we have introduced new products such as: Agilia®, which offers superior coverage and filling abilities and self-leveling capability, with enhanced durability and appearance. In addition, we recently introduced decorative concretes in some markets through our Artevia Color® series. Demand for new products and for a broader range of products is accelerating due to sustainability initiatives and new customer needs. In association with a leading partner, Bouygues Construction, we have launched in 2009 a new generation of concrete to boost buildings' energy performance: the Thermedia® range. We believe our strong research and development program gives us a distinct advantage over our competitors.

See Section 3.9 (Innovation, Research & Development) for more information on the R&D in the Group.

ASPHALT AND PAVING

In North America and the United Kingdom, we produce and sell asphalt for road surfacing and paving. Asphalt consists of 90-95% dried aggregates mixed with 5-10% heated liquid bitumen, a by-product of oil refining that acts as a binder. In these markets, we also provide road contracting and surfacing services.

In Asphalt we are using our internal Research center to develop new products, such as the Durapave, with enhanced appearance, placing and energy efficiency properties. Demand for new products and for a broader range of products is accelerating due to environmental initiatives and new customer needs.

Production and Facilities Information

AGGREGATES

Aggregates production involves primarily blasting hard rock from quarries and then crushing and screening it to various sizes to meet our customer's needs. Aggregates production also involves the extraction of sand and gravel from both land and marine locations, which generally requires less crushing but still requires screening to different sizes. The production of aggregates entails intensive use of heavy equipment and involves regular use of loaders, haul trucks, crushers and other heavy equipment at our quarries. After mineral extraction, we restore our sites to a high standard so that they may be used for other purposes: agricultural, commercial and natural.

In a world of growing environmental pressures, where it is increasingly difficult to obtain extraction permits, and where mineral

resources are becoming scarcer, mineral reserve management is a key to success in the aggregate business. Consequently, we emphasize mineral and land management in our business. Across our existing markets, we regularly search for new material reserves to replace depleting deposits well in advance of their exhaustion and we work to obtain necessary government permits allowing the extraction of our raw materials. We seek to position new reserves as close to our markets as possible. We are also very active in developing our reserve portfolio in new markets. At December 31, 2009, we estimate that we had in excess of 40 years of permitted reserves at current levels of production. We control significant additional aggregates deposits, for which we have either not yet received or requested extraction permits.

CONCRETE

Ready mixed concrete is produced by mixing aggregates, cement, chemical admixtures and water in varying proportions at concrete production plants and placing the resulting mixture in concrete trucks where it is usually mixed further and delivered to our customers. We obtain most of our concrete raw materials (e.g. cement and aggregates) from internal sources. Concrete with equipment for combining raw materials in desired ratios, checking the quality of the product obtained, and placing the mixture into concrete trucks. Concrete plants can be either fixed permanent sites or portable facilities, which may be located at our customers' construction sites.

Many concrete mixes are designed to achieve various performance characteristics desired by our customers. Cement and aggregate chemistries may be varied, chemical admixtures may be added (such as retarding or accelerating agents) and other cementitious materials (such as fly ash or slag) may be substituted for portions of cement to adjust the concrete performance characteristics desired by the customer. Consequently, significant technical expertise and quality control are required to address the many construction issues our customers face, such as concrete setting time, pumpability, placeability, weather conditions, shrinkage and structural strength. Through our extensive research and development activities, we focus on supplying concrete that meets these various needs.

Because of concrete's limited setting time, delivery logistics are key to ensure the cost efficiency and timely delivery of our product.

Raw material prices account for approximately 70% of the cost to supply concrete and may vary considerably across the many markets in which we operate. Given the significantly high

percentage of raw materials costs, we strive to adjust concrete mix designs to optimize our raw material usage. Delivery represents the next largest cost component, accounting for approximately 20% of the costs to supply concrete.

PRE-CAST CONCRETE PIPES, WALL PANELS AND OTHER PRODUCTS

These products are manufactured by pouring the proper type of concrete into molds and compacting the concrete through pressure or vibration or a combination of both. The pre-cast plants are usually located close to aggregates resources in order to limit the transport costs.

ASPHALT AND PAVING

As described above, asphalt is produced by blending aggregates with liquid bitumen at asphalt production plants. We obtain much of the aggregates needed to produce asphalt from internal sources and purchase the bitumen from third party suppliers. Bitumen is a by-product of petroleum refining, the price of which is tied to oil prices. Asphalt is produced at low capital-intensive plants consisting of raw material storage facilities and equipment for combining raw materials in the proper proportions at a high temperature. Our asphalt plants range in output from 5,000 to 500,000 tonnes per year and are located in North America and the United Kingdom. In conjunction with our asphalt production, we also provide road contracting and surfacing services in these regions, where we frequently have leading positions based on sales.

Customers

We sell our aggregates, concrete and asphalt primarily in local markets to thousands of unaffiliated customers throughout the world. Markets are local because of the high cost of transporting these products over land and because most of these products are delivered in trucks. However, where our quarries have access to shipping lanes or railroads, we may ship aggregates over significant distances.

We sell aggregates primarily to concrete producers, manufacturers of pre-cast concrete products, asphalt producers, road contractors and construction companies of all sizes. In some markets, we sell aggregates for use in various industrial processes, such as steel manufacturing. We sell concrete primarily to construction and road contractors ranging from major international construction companies to small residential builders, farmers and do-it-yourself enthusiasts. We sell asphalt primarily to road contractors for the construction of roads, driveways and

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3.3 Business Description

parking lots, as well as directly to state and local authorities.

Our customers generally purchase aggregates, concrete and asphalt in quantities sufficient to meet their immediate requirements. Occasionally, we enter into agreements to supply aggregates to certain plants which produce concrete, asphalt or pre-cast concrete products. These contracts tend to be renegotiated annually. Backlog orders for our aggregates, concrete and asphalt are normally not significant.

Markets

DESCRIPTION OF MARKETS AND OF OUR POSITION IN THESE MARKETS

Most local aggregates, concrete and asphalt markets are highly fragmented and are served by a number of multinational, regional and local producers.

Globally, the **aggregates** industry is in the early stages of consolidation. We face competition in our local markets from independent operators, regional producers such as Martin Marietta Materials and Vulcan Materials in the United States and international players (Cemex, CRH, HeidelbergCement and Holcim).

Environmental and planning laws in many countries restrict new quarry development. In addition, excluding the cost of land and mineral rights, the plant and equipment costs for a new quarry range from around two to four million euros for a small quarry to over 45 million euros for a very large quarry. We have implemented modules to standardize the design and construction of our plants.

We believe we have a strong competitive position in aggregates through our strong reserve positions in key markets. Our worldwide experience allows us to develop, employ and refine business models through which we share and implement best practices relating to strategy, sales and marketing, manufacturing and land management; this gives us a superior quality product to offer to the market. In addition, we have a strong understanding of the needs of most of our

aggregates customers since we are vertically integrated in their predominant lines of business. Finally, we believe that we have a reputation for responsible environmental stewardship and land restoration, which assists us in obtaining new permits more easily and encourages landowners to deal with us as the operator of choice.

Consolidation in the global **concrete** industry is less pronounced and, as with aggregates, we face competition from numerous independent operators throughout our markets. However, we often compete with multinational groups such as Cemex, CRH, HeidelbergCement, Holcim and Italcementi.

An essential element of our strategy is innovation. We have developed substantial technical expertise relating to concrete. Consequently, we can provide significant technical support and services to our customers to differentiate us from competitors. Furthermore, as a consequence of this technical expertise, we recently developed several new products, such as Agilia®, Artevia®, Chronolia®, Extensia® and the new Thermedia® range. Again, our worldwide experience permits us to further differentiate ourselves based on product quality and capability.

To improve our competitive position in local concrete markets, we locate our plants to optimize our delivery flexibility, production capacity and backup capability. We evaluate each local market periodically and may realign our plant positioning to maximize profitability when market demand declines or capacity rises too high. We increased our use of mobile plants in a number of markets to increase our flexibility in realigning plants in response to market changes and to meet customers' needs.

Like concrete, **asphalt** must be delivered quickly after it is produced. Thus, the competitive radius of an asphalt plant is limited and asphalt markets tend to be very local. Generally speaking, asphalt is sold directly by the asphalt producer to the customer, with only very limited use of intermediate distributors or

agents since prompt and reliable delivery in insulated vehicles is essential.

LOCATION OF OUR MARKETS

The majority of our aggregates, concrete and asphalt operations are located in Western Europe and North America, where national demand generally moves in line with the country's level of infrastructure and construction spending. Shipping aggregates over long distances is costly, and concrete and asphalt cannot be transported over distances that involve more than about one hour's transportation time. Consequently, markets for these products tend to be local in nature and, while brand recognition and loyalty play a role in sales of these products, local customers tend to choose producers based on location, quality of product, reliability of service and price. Furthermore, demand for concrete and asphalt depends mostly on local market conditions, which can vary dramatically within and across a broader regional or national market.

Generally, we restrict our aggregates and concrete operations to markets where the nature and enforcement of applicable regulations provide a level playing field. We usually avoid countries where small local operators are not obliged to follow appropriate environmental and labor standards, because they either do not exist locally or are not enforced. Consequently, we are selective in choosing the growing markets in which we wish to conduct our aggregates and concrete operations, selecting only those where the appropriate standards are in place.

PORTFOLIO MANAGEMENT

In line with the Group's strategic priorities, we continue our growth in emerging markets: with the acquisition of L&T Concrete in October 2008, we became the leader in the Indian ready mix concrete market. Main divestments done in 2009 are mainly made in matured market: Canada (Asphalt and Paving, Pre-cast, Concrete Products), Chile (Ready-Mix and Aggregates), Italy (Ready-Mix) and Switzerland (Aggregates).

INFORMATION ON LAFARGE

3.3 Business Description

BREAKDOWN BY REGION

We produce and sell aggregates and concrete in those regions and countries of the world listed in the table below. The table shows the number of sites we operated at December 31,

2009 and the volume of aggregates and concrete our consolidated operations sold in 2009.

Volumes sold take into account 100% of volumes from fully consolidated subsidiaries and the consolidation percentage for proportionately consolidated subsidiaries.

REGION/COUNTRY	NUMBER OF INDUSTRIAL SITES		VOLUMES SOLD	
	AGGREGATES	CONCRETE	AGGREGATES <i>(million tonnes)</i>	CONCRETE <i>(million m³)</i>
WESTERN EUROPE				
France	138	269	38.7	7.0
United Kingdom	52	119	12.8	1.6
Spain	15	125	7.1	2.9
Greece	10	23	3.5	1.0
Portugal	4	30	2.1	1.1
Other	1	17	1.3	0.5
NORTH AMERICA				
Canada	233	136	48.8	3.8
United States	70	115	45.0	2.9
CENTRAL & EASTERN EUROPE				
Poland	14	23	8.0	0.5
Romania	13	14	2.0	0.4
Ukraine	3	-	0.4	-
MIDDLE EAST & AFRICA				
South Africa	23	53	7.4	1.6
Egypt	5	21	2.9	1.6
Algeria	3	6	0.6	0.5
Qatar	1	16	2.0	1.0
Oman	-	11	-	0.3
Saudi Arabia	-	3	-	0.2
United Arab Emirates	-	3	-	0.3
Jordan	-	8	-	0.6
OTHER				
Brazil	3	41	2.3	0.8
Malaysia/Singapore	4	34	2.0	1.4
India	-	68	0.1	3.4
Others	5	41	9.0	3.8
TOTAL	597	1,176	196.0	37.2

In 2009, our asphalt operations produced and sold a total of 4.7 million tonnes in the United States, Canada and the United Kingdom.