

# The Magic of Beer

By Gunter Pauli

*This article introduces a fresh approach to the business model of beer brewing as one of the 100 innovations that shape "The Blue Economy". This article is part of a broad effort to stimulate entrepreneurship, competitiveness and employment.*

## The Market

The world market for beer represents just under \$110 billion in turnover worldwide. In 2011, the market volume is expected to have grown with 2.5 percent. China and Africa expanded over the same period with 5 percent, and Latin America by almost 3 percent. China is the world's largest beer drinker, followed by the US and Russia, putting Germany in fifth place behind Brazil. The top country for per capita consumption is the Czech Republic, followed by Ireland and Germany. While European sales of beer dropped 7 percent over the past five years, sales of non-alcohol beer increased by 37 percent. With 5.8 liters a person in 2010, Spain is the world leader in the per capita consumption of non-alcoholic beer commanding a market share of 13 percent.

The sector is dominated by four brewers who control just over half of the world market of 1.8 billion hectoliters. These major players generate 70 percent of the profits in the sector. The Belgium-based Anheuser-Busch InBev sold in 2010 some 350 million hectoliters, well ahead of SABMiller just under 250 million. Heineken brews just over 200 million and Carlsberg around 125 million, while the Chinese brewer Tsingtao sold 50 million hectoliters per year. The market share of the top ten brewers moved from 37 percent of the world total in 1998 to 62 percent in 2004, and continues to rise. All beer brewers are taking position in China with InBev owning in 2011 already 30 plants in 8 provinces.

The globalization of beer has turned this once artisanal and locally produced drink into a branded commodity like soap and detergents strongly supported by advertising. This development is confirmed by the spending on publicity. Procter & Gamble and Unilever are the largest global advertisers. The personal care brands have just replaced the automotive industry on the top spot, closely followed by the brewers Anheuser-Busch InBev and SABMiller. While the top brands go global, an estimated 4,000 micro-breweries and brewpubs are nibbling away market share and profit from the global players in niche markets. The success of these small operations demonstrate the capacity to maintain the art and pursue the quality at a premium price.

Belgium still has seven monastic breweries which have been in production for centuries and continue the practice with remarkable marketing appeal. In spite of strong global demand and investment funds readily available, these breweries are not prepared to increase output, sticking to their outstanding quality based on traditional art. Several craft breweries in Flanders (Northern part of Belgium) still harvest each year wild yeast. It is calculated that in Flanders only, a region with a strong brewing tradition, over 3,000 different yeast are available for beer fermentation.

## **The Innovation**

The globalization forced brewers to embark on searching for more economies of scale through standardization. The traditional brewing process according to the highly esteemed German Purity Law prescribes that beer is brewed from malt, hops, yeast and water. Instead of using barley, brewers started using rice, a much cheaper commodity. Then brew masters of the large conglomerates backed-up by sophisticated laboratories decided to outsource the extraction of starch and introduce enzymes to speed up starch modification and stability. Temperature modulation further shortened the lager time of several weeks to one week or even less. This represents massive savings in time and space, increasing throughput with a factor of ten with the same core equipment. The reduction of space and time leaves few new windows of opportunity to cut costs any further. Time may have come to generate more revenue.

Jim Lueders got his brewmaster education at the Doemens Brewing School in Munich (Germany). After graduating in 1990 he has visited and studied more than 200 breweries and related facilities in 15 countries. He believes that the brewing industry is a craft and worships quality, whereby he masters every step of the procedure to make an exceptional beer. He developed detailed expertise in creating the business plan, dimension the facilities, choose and install equipment, train new operators, decide on the product mix and fine tune the operations. He was always faced with the request to cut costs and has obliged to the best of his abilities. However, when he was exposed to the concept of generating more revenue with the available sources of the brewery a new business model emerged. He studied pioneering examples of Prof. George Chan with the Tunweni Brewery in Tsumeb (Namibia) dating back to 1996 where the integrated farming concept based on the five kingdoms of nature was tested in cooperation with the Ohlthaver and List Group. He then took time to design a new business that provides more income, and thus reduces the investment risk.

## **The First Cash Flow**

Jim has the experience to design, build and operate a small brewery that may cost as low as \$120,000. If combined with a restaurant, this cluster of activities can increase food sales by as much as 25 percent. The break-even point is between 3,000 and 6,000 barrels per year.

When the beer is sold directly to the customer, the point of equilibrium could be reached for only half that amount. One of the key costs is the bottle filling lines with equipment that will cost a minimum of \$60,000. Jim often proposes small kegs in aluminum or glass which are returned by the customer for refills, cutting out the investment, while reducing the cost per pint to clients. With more than 20 projects of the traditional type implemented in the US, Mexico, West Indies and Japan, and equipped with these new insights, Jim bought land in Stevensville, Montana (USA), and started purchasing second hand equipment from a century old wooden barn to copper kettles recovered from a bankruptcy.

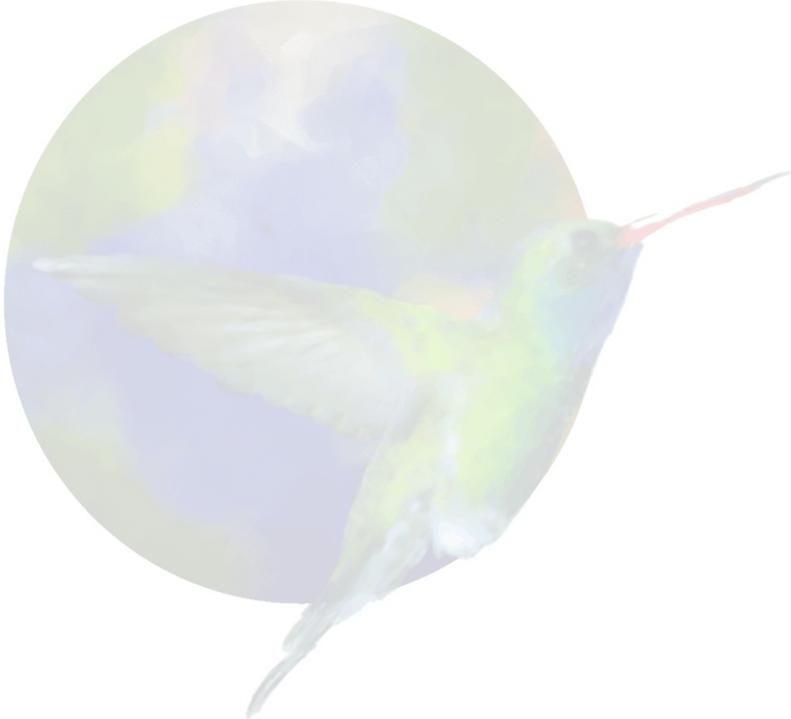
He started to put more value on each of his waste streams starting with the spent grains. Rich in fibers and protein, these waste represents 92 percent of the dry weight of the malted barley, meaning that only eight percent has been given a value. Void of starch, these residues are partly blended into a bread dough as was done for centuries in Germany, and partly used as a substrate for mushroom farming. The spent substrate, after harvesting the mushrooms, is enriched with amino acids. A feed that was at first of low quality and given away for cattle farmers for the cost of transportation, is now converted into a quality nutriment for chickens and pigs which Jim plans to farm and raise. The pig manure plus the waste water that has been used to cleanse the kegs, vats and pens is channelled into a digester that produces biogas. The slurry from the digester serves as feed for algae in a shallow ponds. This process contributes to the production of benthos, phytoplankton and zooplankton, ideal for feeding fish. Breweries typically require 5 liters of water for each liter of beer. This water is ideally used to farm fish. A process where recycled building materials and equipment are upcycled for the building and operations, and where everything that enters the facility is used to generate more food, water, energy and jobs meets the basic conditions of The Blue Economy. In January 2012, Jim put out his first batch of craft beer and exclaims that the process has only just begun.

## **The Opportunity**

The beer brewery business along the lines described and implemented by Jim have great similarity with the coffee project that was reported on earlier (Case 3). Jim has the advantage of being able to deliver turnkey operations, reducing the investments and lowering the risks, while improving the revenues. This makes particular sense in the high growth regions like China and Africa where there is a thirst for beer, but also a shortage of water and a need for food security. If the program of Jim becomes a standard then the brewery will become a catalyst for local economic development. The Bhutanese non-alcoholic buckwheat Pawo beer proposed in cooperation with Japanese supporters additionally demonstrates that beer does not have to be associated with alcohol and this could yet represent another option for entrepreneurs. Jim has offered to support this initiative so that it will meet the highest technical standards and the world's most discerning taste buds.

The magical beer brewery still produces a traditional or non-alcoholic beer, bread and mushrooms. But, since the mushroom output could reach large volumes due to the massive amount of waste generated, these can be processed on-site into veggie sausages. Now with beer, bread and sausages, it seems that a real Bavarian party is about to become a generator of cash, while offering healthy and pleasant products, generating jobs. It is such a surprise to many outsiders that this is considered possible, and thus the concept has been qualified as magical. The power of the entrepreneurs is to convert what others think is impossible into a reality.

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... Further information on the 100 innovations at [www.theblueeconomy.org](http://www.theblueeconomy.org)

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