

WWF Climate Savers innovation cases: Tetra Pak China



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Innovative Approaches for Greenhouse Gas Reduction: Chinese Innovation Case Studies

Tetra Pak China: One Step Ahead

We are the market leader in the industry. We have to do many things that others are not willing to do. Tetra Pak has always had a long-term vision for the market; we don't only focus on what is in front of us.

--J.T. Luo, Vice President and Cluster Leader of Supply Chain Management,
Tetra Pack China

On 8 July 2009, Tetra Pak opened a new plant for the manufacture of packaging for dairy products in Hohhot, Northern China. The company invested €60 million in the plant, which has a production capacity of 11 billion packs a year. This is Tetra Pak's fourth plant in China, and it represents an ambitious scaling up of production as the company seeks to keep pace with the soaring demand for aseptic packaging in China. Even as the plant opened, Tetra Pak announced that it was investing a further €53 million to set up an additional production line that would increase production by a further 10 billion packs, bringing its total capacity in China to 60 billion packs.

The challenges in designing and building the plant were immense. Hohhot is the capital of the Inner Mongolian Autonomous Region, a remote northern region where supply and logistics are, to say the least, problematic. The site was chosen so that the plant would be close to key customers: Mengniu and Yili, two of China's leading dairy producers, are both based in Hohhot. This positioning gives Tetra Pak a strong strategic advantage.

The Hohhot plant has a number of features that mark it out. First, there is its size. The expansion to 20 billion packs a year in 2010 made it the largest factory in Tetra Pak China. It is also one of the largest industrial complexes in Inner Mongolia and represents a major investment in the region. Second, there is the plant's green design. Perhaps surprisingly, given the logistical challenges, Tetra Pak decided to manage both of its main inputs – electricity and paper pulp – in a sustainable way. More, Tetra Pak has set itself the mission of greening the entire dairy value chain in China.

What motivates a multi-national company investing hundreds of millions of Euros in China to take the green route? How successful has Tetra Pak been in doing so? What problems and challenges did the company encounter? The case will attempt to answer some of those questions.



Making food safe and available

Tetra Pak is the world's leading food processing and packaging company, with activities in more than 150 countries worldwide. It employs more than 21,000 staff. Net sales reached €8.95 billion in 2009. Tetra Pak's main products are packages, filling machines, processing and distribution equipment.

Tetra Pak was founded in Lund, Sweden, in 1951 by Dr. Ruben Rausing. His vision was simple: *to make food safe and available, everywhere*. Another of Dr. Rausing's principles when founding the company was that a package should save more than it costs, which is aligned with WWF climate savers magnifier approach "save more emissions than it costs". This principle has been applied to both the commercial and environmental aspects of the company's packaging systems. Preventing food losses during product distribution is the key benefit of Tetra Pak cartons, and this reduces both costs and environmental impacts for customers.¹

While it is easy to think of Tetra Pak as a 'beverage carton' company, this underestimates the subtlety of keeping a diverse set of foods safe and available in myriad conditions. Tetra Pak offers eleven basic carton types, each with numerous variations. For example, cartons that keep acidic products – which usually degrade materials rapidly – fresh without preservatives. However, what is good for tomato sauce or wine may not suit a delicate milk product. Likewise, a product designed for a North American distribution system – large trucks covering long distances with pallets stacked high – may not meet the needs of distribution by motorcycle in rural south-east Asia. Constant adaptation is required to ensure that Tetra Pak products continue to meet customer needs.

Tetra Pak also has a holistic approach which addresses environmental impacts (beyond just waste) at every stage of the life cycle of their products and services, from design, purchasing of materials, manufacturing, transport, filling and consumption through to the end of the life of the package. The company's aseptic process ensures that both food and packaging materials are free from harmful bacteria when food is packaged. Everything in the production line must be sterile. That includes food and packaging materials, all machinery and the environment in which the packaging takes place. In doing so, Tetra Pak aseptic technology keeps food safe, fresh and flavourful for at least six months — without refrigeration or preservatives. Tetra Pak uses scientifically based life cycle assessments (LCAs) to analyse the impact of packaging and processes throughout the whole supply chain.

As a partner in the WWF's Climate Savers program, Tetra Pak has committed to globally reduce its CO₂ emissions while continuing to grow. One ambitious goal was to achieve a 10 per cent reduction of CO₂ emissions compared to 2005, in absolute terms by 2010. This has been achieved on time. In its mission statement, Tetra Pak declares:

¹ Tetra Pak products are known generically as 'cartons', and are classed into two types, aseptic cartons and non-aseptic cartons. All products currently made in China are classed as 'aseptic cartons'. The term 'pack', used on the previous page, is a unit name.

We believe in responsible industry leadership, creating profitable growth in harmony with environmental sustainability and good corporate citizenship...Our Environmental Policy describes our environmental commitment at every step in the consumption and production chain – from society to raw materials.

--Tetra Pak mission statement

Tetra Pak China: bringing good to the surrounding people

Thirty years ago when China had just started its economic reform, Tetra Pak came here with a strong belief in the country's market potential. We are grateful for the trust that the Chinese dairy and beverage industry has shown us during this period and for the opportunity of participating in the growth of this industry with our innovative technology and service solutions. Today, China has become one of our largest worldwide markets and will continue to be central to our strategy in the future.

--Dennis Jönsson, President of and CEO of the Tetra Pak Group,

Tetra Pak's presence in China began in 1979 with the introduction of aseptic packaging to its first filling-line in the world's most populous country. Interestingly, the name Tetra Pak is rendered in Chinese using two characters as 'li le'. Literally, 'li' can mean *benefit, interest, wellness* or *profit*, while 'le' means *happiness*. At the same time, the combination of the two words has another meaning which comes from Buddhism, and it means: *being good to the surrounding people, helping them and bringing good to society*.



Thirty years on, Tetra Pak China continues to lead the market despite ever-growing competition from both domestic and international competitors. In 2008, China accounted for nearly 10 per cent of Tetra Pak's global business in terms of revenue. In 2009, the company had 75 per cent of the country's aseptic carton packaging market. Its investment in the country by 2010 had grown to €350 million with a total capacity of approximately 60 billion packs a year in its four Chinese plants, including a new production line added to the Hohhot plant.

WWF welcomes this agreement between Tetra Pak and the Inner Mongolia Development and Reform Commission. It is another example of the importance of corporate and government collaboration to reduce CO₂ emissions.

--Oliver Rapf, WWF International's Head of Business and Industry Engagement on Climate Change.

According to Dairy Association of China, the country's dairy industry has grown by 20 per cent over the past decade. Every Chinese consumes on average 30 kg of dairy products annually, much less than the world average of 120 kg, or average of 300 kg for developed nations. This suggests there is huge growth potential for the dairy industry in China, and this growth in turn will drive the growth of dairy packaging. As Tetra Pak CEO Dennis Jönsson says proudly, 'We are growing with China.'

Greening the Chinese supply chain

The convergence of Tetra Pak's corporate values and its mission to 'grow with China' can be seen clearly at the Hohhot plant. Four concepts and policies are at the heart of the new plant. The first two – a reliance on green electricity and sustainable sources of paper pulp – are part of the upstream side of the supply chain. The other two – reverse logistics or recycling and the decision to become a leader in sustainable supply chain management (SSCM) – are on the downstream side. These are not confined to the Hohhot plant, but are part of Tetra Pak China's overall strategy.

Green electricity

According to J.T. Luo, Vice President and Cluster Leader of Supply Chain Management for Tetra Pak China, right at the outset the company set a carbon emission reduction target and invited consultants from Sweden to advise on the green design of the factory and the use of environmentally friendly construction materials:

The air conditioning system in the Hohhot plant was planned systematically. The original idea was to improve our energy efficiency. This is a significant problem for the Hohhot plant, because temperatures change greatly within the plant every day. The reason for this is that outdoor temperatures in Hohhot fluctuate very strongly between heat and cold.

It is not uncommon for temperatures in Hohhot to fluctuate by 15 or even 20 degrees between day and night. This is one reason why the plant uses 20 million kilowatts of electricity per year.

The Hohhot facility is the first manufacturing plant in Inner Mongolia, and among the first in China, to establish contracts with government-owned electricity generators to supply exclusively green electricity. In this way the plant aims to reduce its CO₂ emissions by 16,000 tonnes a year, and to encourage investment in clean power generation. It also means that instead of building a dedicated power generation for its factory, Tetra Pak is paying a premium to state energy companies so that they will invest in clean generation, and employs third-party auditors to ensure this capacity is provided through the state grid.

The plant has a green space outside with a solar energy system to provide hot water for daily use. All lighting is with low-consumption LED bulbs, and walls are constructed from well insulated cavity bricks. Thus energy consumption is minimised in a plant that was 'built as green'.

FSC certified forests

A key raw material used in packaging is wood pulp. Tetra Pak is working towards accepting wood pulp only from forests certified by the Forest Stewardship Council (FSC). The Yongan Forest in South China is the first forest, in which Tetra Pak China has selected to pass the FSC certification. It achieved FSC certification in 2008 after a complex project in which Tetra Pak and the WWF worked with the forests'

owner and forestry workers. Carol Yang, Vice President and Cluster Leader of Corporate Communication of Tetra Pak China, explained the background:

The WWF recommended Yongan Forest. It would have been easier to achieve certification for a northern forest because forests in the north are wholly state-owned. However, forests in the south China have complex ownership structures: some are in collective ownership, some in state ownership, some belong to private families and some a combination of the three. In these cases, you have to coordinate all the owners to achieve a satisfactory management level. It took us one year to help Yongan Forestry to pass this certification, a process that included doing research on the local situation and inviting specialists to train the workers. There are many detailed requirements for the FSC certificate, including protecting biodiversity and local people's daily lives, etc. and it takes time to meet all the standards with all the required training.

As awareness of FSC was relatively low in China, Tetra Pak organized a series of activities to explain what certification meant and the significance of forest protection. Tetra Pak China admitted that this was also a learning process for the company. Kangle Xu, Corporate Communication Executive of Tetra Pak China, acknowledged that

The WWF contributed a lot to this project and invited professors in forestry from the Chinese Academy of Forestry and Renmin University of China to train the forestry managers and workers (at Yongan forestry). WWF devoted great efforts to create a locally applicable regulation for FSC. Another good thing is that the Fund (WWF) works gently and never takes radical actions.

Carol Yang provided more details on the fruitful link with WWF:

In fact, WWF and we have reached a consensus in the first place that we both want to promote FSC certification in China and help the State Forestry Administration (SFA) and its provincial subsidiaries to do the certification. At this point, it has been clarified that this activity was not linked to our raw material sourcing and our purpose is not necessarily to find the forest for future procurement. Our main criterion to consider was around the issue of what are the most sensible and important things we can do in China. Now, Yongan forestry is a benchmark for others.

Tetra Pak's decision to certify Yongan forest in spite of its fragmented ownership structure may be explained as an enactment of its established philosophy of 'being one step ahead'. The certification initiative is not a one-off: Tetra Pak China is currently helping certify another forest, Tengchong Forest, following WWF's recommendation. WWF has praised Tetra Pak for its dedicated efforts in advocating and implementing responsible forest management systems in China, an example of the company's dedication to 'protect what's good'². Tetra Pak has already manufactured 1.4 billion FSC certified packages in China, and the expectation is that eventually all Tetra Pak's paper packaging will come from forests with FSC certification.

² Company's motto on the logo

Recycling

What is waste from one process may be raw material for another. As one Tetra Pak manager puts it, ‘waste is actually resource placed in the wrong places’.

China lacks a well-organized recycling infrastructure, and public awareness of the potential value of recycling is low. Without a large-scale and general interest in recycling, it has been impossible to attract the interest of existing state or private companies. Carol Yang commented: ‘In the past, our environmental engineers were refused by those big paper mills, because they were reluctant to introduce a new production line to dispose of the waste packages.’

Since 1998, building on experience gained in Taiwan and elsewhere, Tetra Pak China has fostered the growth of small companies specifically feeding off the waste from its packaging plants by providing advanced technologies and cooperative manufacturing. By 2010, Tetra Pak was working with more than ten small privately owned recycling partners. One such business extracts paper pulp from waste cartons in a ‘washing machine’. Another, collaboratively developed with a Chinese enterprise in Shandong Province in 2006 and operational since 2008, separates composite materials of aluminum and plastic with a purity of 99.5 per cent.

All these three materials (paper pulp, aluminum and plastic) are in demand as separate commodities. Another approach has been to re-use the combined materials for new products. One process mashes and presses the waste into ‘Caile plate’. Benches in Shanghai’s Expo Park are now made of this material. A separate business has developed extrusion molding of the mashed and stirred waste into wood-plastic composite, ideal construction materials for flooring. Concerned about possible environmental risks associated with the production process, Tetra Pak invited Shanghai Environmental Institution to evaluate this technology in the earlier stages of development that subsequently certified that this technology met all the environmental requirements.

In 2009, Tetra Pak China launched a recycling campaign to support the Shanghai World Expo. When the company ran recycling campaigns in the local communities and then donated benches made of Caile plate to the Expo site, it was found that several of Tetra Pak’s clients also wanted to participate in these activities. For example, Mengniu and Guangming, two dairy producers, began quickly to manage some waste collection in Shanghai themselves. In the months since the Expo, almost all Tetra Pak clients have inquired if Tetra Pak could make a presentation on environmental protection and give them some ideas for their own waste recycling. Meanwhile the demand for products of both technologies is growing, specifically for outdoor furniture and dustbins as these are less likely to be stolen than metal ones.

Becoming a dairy supply chain leader in sustainability

In the Chinese market, Tetra Pak straddles two industries. Although primarily a packaging company, its operations are entirely tied up with the dairy industry. Thus both supply chains are crucial to its business.

Tetra Pak China’s dependence on the dairy industry was brought sharply into focus by the adulterated milk scandal of 2008. Also known as the ammonium hydrogen dimmer crisis, this caused widespread distrust of all domestic dairy brands including Mengniu and Yili. Facing rapidly growing demand for dairy products in China, some dairy farmers adulterated the raw milk with melamine in order to boost

protein levels, and hence prices.³ This practice had apparently been widespread amongst dairy farmers for some time, in spite of the toxic effects on humans, especially when the milk was used in formula for infants. In autumn 2008 six infants died from kidney damage, and more than 800 were hospitalized. It is estimated that adulterated milk products affected over 300,000 people, and customers switched to more expensive but trusted international brands.

Tetra Pak China was affected too. The expected growth rate for 2008 was 16 per cent, but Tetra Pak China achieved only 5 per cent growth that year. This is a textbook example of supply chain disruption; the disruption of one material, raw milk, causes disruption of the whole chain.

Tetra Pak is neither a dairy producer nor a pastureland owner, so the company is able to grow only so long as this industry itself is developing sustainably. In a long-term project to reform the dairy industry, Tetra Pak has for more than ten years sponsored a cooperative research programme with the School of Economics of Renmin University in Beijing. The two institutions are trying to transform a private and fragmented dairy farm model into an intensive and modern one.

Yun Jiang, Climate Savers Senior Programme Officer at WWF China, commented that:

Tetra Pak is a good example of how promoting good ideas can affect supply chains in China. Tetra Pak did a good job in coping with climate change and its actions having great influence over dairy enterprises. For example, Tetra Pak China encouraged Mengniu to join the 'Climate Savers project'.

Alongside its packaging technology, Tetra Pak has introduced new low energy production lines to benefit its customers, such as a milk-separating centrifuge that saved 30 per cent of milk production costs. It was through this introduction that Tetra Pak China helped its customer, Mengniu, to learn about the Climate Savers programme run by the WWF. Mengniu is now in the process of applying for Climate Savers membership.

Tetra Pak is also managing the certification of pasturelands. State-owned pasturelands possess modern equipment and good-quality cows, but are weak in management. Tetra Pak has set up a professional team to upgrade Chinese pasturelands by offering management training and guidelines, helping them be more efficient and reducing CO2 emission. More than 30 pasturelands have now achieved EU standards. Tetra Pak opened a training school for private dairy farmers, teaching them modern ways of raising dairy cows. The company also produced a series of educational films and wrote books in partnership with CCTV 7 (China Central Television Channel 7) and distributed them for free. Later, when some pirated DVDs of these films were found in markets, Tetra Pak China was delighted: the piracy shows that many people are eager to learn from the materials they produced!

Enablers for the implementation

³ Melamine contains 66% [nitrogen](#) but is toxic to humans. The State and Provincial Food and Drug Administration use the level of [nitrogen](#) as an indicator of level of protein which is difficult to measure directly.

A number of factors at Tetra Pak have enabled the implementation of these innovative solutions in China. These include:

- Long term position on sustainability
- Being one step ahead
- Clear sustainable strategy and business model
- Top management support
- Congruence of economic and sustainable benefits
- Environment related KPIs
- Supportive organizational structure

Long term position on sustainability

Tetra Pak believes that “environmental protection’ is an important part of the ‘culture of the company’, and regards environmental protection as a priority. As J.T. Luo puts it, “I think this is a very real thing. If any company doesn’t look far enough ahead, it can’t live for over three years. I’ve spent 25 years in this company and this company looks very far. If Tetra Pak is going to develop further, it must see farther.”

Attention to environmental protection on the part of the public can only increase in China, and as one manager puts it ‘The one who walks longest will be the one who best protects the environment’. Social responsibility for Tetra Pak means ‘if taken from the public, repay to the public’. To quote J.T. Luo again:

You cannot only focus on the short-term benefits, you need to look farther. If you think it is right, you have to persist and finally there will be a return in the future. When doing environmental protection, you cannot always look at economic benefits. The benefits won't come back tomorrow. You should not care too much. This is the only way to walk longer and farther.

Being one step ahead

In 2004 and 2005, when Tetra Pak started to talk about green electricity, recycling and environmental protection with their customers, the response was as if Tetra Pak was talking about something remote. “They did not know what green energy was,” says J.T. Luo, talking about the attitudes the company encountered initially in Hohhot. “When we tried to explain to them, they could not accept what we were doing.”

But the 2008 Olympics, the milk scandal and the Copenhagen Conference of 2009 have all led to a change in attitudes. After experiencing the ‘Green Olympics’, interest in environmental protection on the part of both public and the media soared. Tetra Pak felt that their customers suddenly needed to talk about cooperation on environmental protection.

Clear sustainable strategy and business model

Tetra Pak's policy on responsible business is expressed as 4Rs: renewing, reducing, recycling and responsibility, indeed a Life Cycle Assessment (LCA) and holistic approach toward sustainability. Initially, these were cascaded down from headquarters. However, Tetra Pak came to understand that the Chinese market was different, and there is local adaptation of the 4Rs. This is shown in the Tetra Pak China's focus on recycling. Carol Yang commented:

Basically we follow the global strategy. However, there are some issues in China's market, e.g., 1) the concept of LCA is still novel to most people; 2) there is a limited base of people with LCA knowledge constraining our ability to implement LCA. In fact, we do conduct LCA study in our four factories in China, but do not feel the need to communicate the concept yet. The pressing environmental issue in China is recycling and that's where we focus on for now and in the recent future. As one could imagine, with the market size, China could be dragging down the global recycling rate if we do not put enough emphasis on it.

Top management support

Tetra Pak's CEO comes to China every year to meet key accounts and show support for sustainable initiatives in China. As Carol Yang said:

China is the largest market for Tetra Pak. Only when we do well in China can we succeed globally. Otherwise, China will become the largest burden. Therefore, Tetra Pak headquarters has given us significant support. Our factory in Hohhot is designed to use green power, which received significant support from headquarters. Hohhot is one of Tetra Pak's largest factories. One hundred per cent green electricity in such a big factory has played an important role in reducing our global carbon footprint.

Congruence of economic and sustainable benefits

As Carol Yang says, 'In a sense, FSC certification may be regarded as a charitable activity. But if the charitable things you do are not related to the whole business, it is difficult to be sustainable: on the contrary, I think if the things you do can both benefit society and long term enterprise development, such charity will be sustainable, because it is a win-win situation.'

Environment related Key Performance Indicators (KPIs)

According to Kangle Xu and J.T. Luo, environmental measures are built into Tetra Pak's performance measurement system. Everyone is measured against environmental KPIs. Kangle Xu claimed that 'in fact, for Tetra Pak, no particularly large organizational changes are needed when conducting environmental protection. We've been doing this for a long time and this is the company's culture. So, everyone's job is associated with this.'

Supportive organizational structure

Tetra Pak global has a special team called the Global Environmental Protection team, and this is mirrored in similar structures at country level. These local teams report to the global environmental protection team as well as to the corporate communications department. This shows the company pays much attention to environmental protection and the dual reporting system ensures the local policy is aligned with that from HQ.

Barriers to implementation

At the same time, there have considerable barriers to the implementation of Tetra Pak's ideas and programmes. Some are intrinsic to China's economy at its current stage of development, others are down to Tetra Pak itself. These include:

- Lack of awareness and environmental education amongst the public
- Lack of a waste classification system in China
- Lack of proper promotion prevents innovation dissemination.
- Lack of coordination among sustainable initiatives in Tetra Pak China

Lack of awareness and environmental education amongst the public

As noted above, awareness is now increasing. For example, FSC certification is required by many export customers such as IKEA, and Tetra Pak encourages their suppliers to meet standards required by the European market. But these are new concepts for the public in China, and this has created some friction. As Carol Yang commented:

It is unfair that people challenge us on our 10 per cent CO₂ reduction. Actually, it is a big step forward because there is no support from the government and no system of garbage classification. It is frustrating that the government and the media do not consider our work in an objective and reasonable attitude. We have spent 150 million RMB in the past decade (in doing this), and few other enterprises could afford this project.

Kangle Xu commented that:

Sometimes the public will misunderstand our work. There is a Chinese saying that 'the more work you do, the more mistakes you will make.' Tetra Pak is one of the first enterprises to conduct environmental projects in China, but other companies do not pay much attention to our achievements; rather, they criticize us that we have not been doing enough. In addition, they think that our work must be motivated by a hidden agenda, our production will cause endless troubles, or we are only motivated to make more money. They don't believe that enterprises are willing to pay back to society. We faced great pressure based on this misunderstanding but it is hard to explain it to the public. It discouraged our work to some extent.

Lack of waste classification system in China

A weak garbage classification system has prevented Tetra Pak from employing advanced technologies such as waste incineration. This is important, as incinerating unclassified garbage will produce more CO₂ as a result. This is not just a matter of technology: China has modern incinerators, but not the system to make best use of them. In countries that expect households to sort their garbage everyone participates in the system, thus higher standards can be expected from business. Such a system still needs to be introduced in China. The lack of coordination between different departments and between the central and local government also makes it very hard to develop new practices.

Lack of coordination among sustainable initiatives in Tetra Pak China

In Tetra Pak, capacity building includes four solutions to achieve a 10 per cent reduction in CO₂ reduction. The first is to employ green electricity. The second is to continuously improve technology to reduce energy consumption. The third is to help clients reduce the cost of their packaging and increase production efficiency. The fourth refers to the recycling of waste materials. However there is no single team that controls completely all these four solutions, which are operated by four departments. For example, recycling is the responsibility of the department of environmental protection; supply chain looks after green electricity; and the department of operations works with clients on innovation. It was claimed by one manager that it would be better if the four solutions could be coordinated across the departments.

Summary

Despite these and other problems, Tetra Pak has been a successful innovator in terms of its supply chain relationships with both suppliers and customers, and both have seen benefits as a result. It is hoped that over time, these benefits will be felt more widely in China; and, of course, by Tetra Pak itself. As Kangle Xu said:

In the past, enterprises tended to conduct business secretly, which will lead to one of two endpoints: indulging in empty talk, or no proper promotion of work which is done. Tetra Pak is not an enterprise working mainly on environmental technology. However, we are doing a good job, and so some other enterprises are willing to follow us.

....and the final word....

We believe in responsible industry leadership, creating profitable growth in harmony with environmental sustainability and good corporate citizenship.



**What makes a real difference for
environmental protection?**



Conclusions drawn from the case-studies