

The Environmental Post

INTERNATIONAL  PAPER

WHY INTEGRATED MILLS ARE GREENER

International Paper's low-carbon production sites

In the paper industry, there are mills that manufacture pulp, and mills that transform pulp into paper. But there is a third type: integrated mills producing both pulp and paper. On average, 55% of European mills are integrated. All three of International Paper's European mills are integrated and much greener as a result. Why?



Saillat is the only integrated mill for cut-size paper in France.

Close partnerships with forest owners

One thing that makes integrated paper mills more environmentally friendly than non-integrated facilities is the ability to manage the whole production process, from wood to ream. It starts with establishing long-lasting relationships with forest owners. This guarantees a regular business flow for them, whereas other industries, like the heating sector, are very seasonal. The integrated mill can utilise forest by-products – branches, tree crowns and bark – that might otherwise go to waste. A paper mill partnership also encourages forest owners to certify their wood and adopt sustainable forest management policies.

Using wood as a raw material, the paper industry creates four times more value and retains six times more jobs than the energy sector would by burning wood.
CEPI Sustainability Report 2007

More green energy, less CO₂

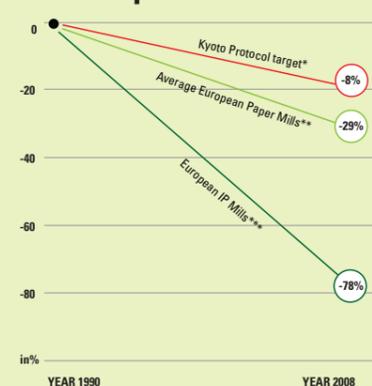
Another factor that makes integrated mills more environmentally friendly is their use of carbon neutral biomass to produce energy. Forest by-products have already been mentioned. In addition, during pulp fabrication it is necessary to separate the cellulose (wood fibres that become paper) from the lignin and any hemicellulose, a substance that constitutes up to a third of the dry mass of wood. In the separation process, the lignin is dissolved and removed, producing so-called black liquor. An excellent eco-fuel, this biomass is burned to generate electricity and steam for the mill.

With this efficient use of wood, integrated mills produce lower carbon emissions. Generating energy on-site also means less reliance on fossil-based energy. Furthermore, unlike an integrated mill that is using liquid pulp, non integrated mills are using dry pulp, resulting in extra energy consumption and in extra transport.

On average, International Paper mills in Europe use 65% green energy, compared to the European average of 54%. In fact, green energy use in these mills has allowed International Paper

to reduce CO₂ emissions by 78% since 1990, far outpacing Kyoto targets (see chart).

Greenhouse gas reductions, Europe 1990-2008



*Kyoto Protocol target set by EU
**CEPI
***International Paper

The European pulp and paper industry is the largest single consumer and producer of renewable energy in Europe.
CEPI Sustainability Report 2009

Optimised transport

International Paper's integrated European mills have a further green advantage. They source their wood from local forests with average lorry distances only 117 km. The mills also serve nearby customers. This optimal combination – from wood delivery to paper delivery – leads to shorter transport distances, less fuel consumption and less CO₂.

Established partnerships with forest owners, the high use of biomass to generate energy on-site, and shorter transportation distances: now you know why International Paper's integrated mills in Europe are so green.

International Paper Europe forest-to-mill distances

Average distance, forest to integrated mill: 117 km by lorry, 469 km by rail. Zero pulp plant-to-mill distance yields zero CO₂ emissions.

At the International Paper mill in Svetogorsk, Russia, 67% of the wood used in paper production is transported via railroad – a greener form of transport than lorries.

Eco-label for the Adagio range

Bringing out the green in coloured paper



You need the brilliance of brightly-hued paper. But you want to buy an environmentally friendly product. What do you do? International Paper has the answer.

The Adagio range has recently received the European Union Eco-label, which along with its PEFC certification makes Adagio the first tinted paper range in Europe to offer the maximum environmental credentials to the end-user.

Well-known and trusted throughout the EU, the Eco-label “flower” logo guarantees that sustainability is taken into account during each step of the product life cycle. During production, energy consumption is kept as low as

possible. Environmental risk related to the use of hazardous chemicals is significantly reduced. Air emissions of sulphur and greenhouse gases are limited. And reduced emissions of chlorine compounds and organic waste help prevent water pollution.

Saillat: world leader in low emissions

The Adagio range is produced at the International Paper integrated mill in Saillat, France. A high level of energy self-sufficiency combined with optimisation at all stages of the manufacturing process makes the Saillat mill one of the best in the world in terms of CO₂ emissions. In fact, Saillat’s greenhouse

gas emissions have been cut by 63% since 1990. This is better than both the CEPI average of 29% and the Kyoto Protocol guidelines, which mandate an 8% reduction.

Reflecting the environmental positioning of the range, the new Adagio packaging will feature easy-to-identify Eco-label and PEFC logos, as well as information about Saillat’s low CO₂ emissions. In addition to these highly visible green credentials, all the other vivid Adagio colours will be easy to see, thanks to the polypro packaging.



DISCOVER our Environmental COMMITMENT

Every day around the world International Paper is dealing seriously with social and environmental sustainability issues. How much do you know about these initiatives? Discover them now with our new DVD.

“One world. Four countries. Thousands of committed people. Now, for the first time on screen, watch as they combine forces to make their communities healthier, more productive and greener.” No, it’s not the latest Hollywood blockbuster. But it is a

good description of a new production just released from International Paper.

Using entertaining video and animation, the interactive “Discover” DVD presents an overview of International Paper’s sustainability commitments and activities. These are illustrated by a variety of examples in various chapters.

Follow the plot

A speech by Senior Vice President Mary Laschinger explains our efforts on behalf of social and environmental issues. “From Tree to Paper” shows how we transform



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raw material into the final product. “Paper Helps the Forest Grow” describes the crucial environmental role of responsible paper production as practiced by International Paper.

The DVD explains the Paper Profile initiative, which provides uniform product declarations to guide paper buyers. There are also profiles of our mills in France, Poland, Russia and Brazil, reporting on a wide range of environmental and social investments and programmes.

Sorry, the exclusive Discover DVD is not available at your local video store. However, you can easily receive your own copy. Just send an email to Julie Argante at julie.argante@ipaper.com.

The Little Green Book

Sustainability Beyond Reasonable Doubt: The Paper and Paper-Based Packaging Industry

Sustainability and climate change are at the top of the agenda for most CEO's and for today's environmentally conscientious consumers. Successfully positioning International Paper and our industry in this context will be vital to the long-term future of our business.



The paper and paper-based packaging industry has a great sustainability story to tell and it's time we started to share it. So we have written "The Little Green Book". We thought it would make it easier for people to understand some of the key facts about how sustainable

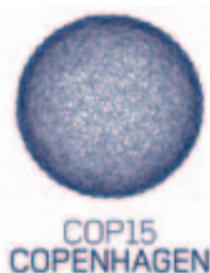
our industry is. This should no longer be a best-kept secret. Everyone has the right to know.

The book examines some of the commonly held myths about our business in relation to sustainability and sets the record straight. It is a reality check showing that our industry has, beyond any reasonable doubt, a truly fantastic environmental sustainability story to tell.

To get your copy please contact **Claudia Brand** at claudia.brand@ipaper.com.

After Copenhagen, what next?

International Paper supports an integrated approach to long-term CO₂ reduction



The goal of the Copenhagen UN climate change conference held in December 2009 was to outline a new international treaty to replace the Kyoto Protocol, which expires in 2012. It produced a weak agreement lacking binding commitments to cut greenhouse gas emissions.

The European Commission has since presented proposals to help revive the UN negotiation process, including the possibility of a unilateral move from a 20% to a 30% reduction in CO₂ emission levels by 2020. This stricter target is currently the subject of a vigorous debate. International Paper supports environmental initiatives, as long as they do not reduce the competitiveness of European industry. It believes that international climate negotiations must focus on a long-term policy for achieving 2050 emissions targets.

Sustainability criteria for biomass energy

One pillar of Europe's greenhouse gas reduction efforts is to increase

the amount of energy generated from renewable energy sources and biomass, including trees and forest by-products. How this shift will be evaluated and regulated is another topic of debate and of strategic importance to International Paper. The issue at stake centres on whether the European Commission will agree to propose legally binding sustainability criteria for biomass as it currently does for biofuels.

The absence of uniform criteria could have multiple consequences for our industry. If the emphasis for achieving the EU's renewable energy targets falls unduly upon the forestry sector and woody biomass in particular, then the market will in practice become distorted with fiber costs increasing substantially.

Setting appropriate policy is all the

more important when one considers the scale of the damage that may be done to the European economy. The pulp & paper industry in Europe is estimated to contribute €27.5bn in direct value added wealth creation, a 2006 study by the Pöyry consultancy group estimates, as compared to €6.3bn from the bio-energy sector utilizing the same wood based fibre volume. In terms of employment creation, a similar picture emerges: the pulp & paper industry creates at core level 6 jobs for every job created by the bio-energy alternative. When total employment creation is considered, the ratio is 13:1 in favour of the pulp & paper industry. The EU cannot afford to disadvantage its pulp & paper industry. In summary, to meet emissions targets it is necessary to assess policies for land use, forest, waste, agriculture, industry and energy in an integrated way.

Kenitra water reduction project

Irreplaceable water is our planet's most precious resource. So it makes sense to continually find new ways to use it wisely. That is precisely what's happening at the International Paper containerboard mill in Kenitra, Morocco, just north of the capital Rabat.

Equipped with production lines for testliner and coated board, the Kenitra mill turns out 70,000 tonnes of paper annually. Following an extensive mill-wide study, modifications were developed to reduce water usage according to paper industry standards and good practices

for water consumption rationalisation. Consequently, this year the facility will spend over \$1 million to cut its fresh water consumption.

Given the complexity of the paper-making process, there is no single fix for cutting water use. Instead, the problem is being tackled from several directions. For example, the installation of flow control for all sealing water will reduce total volume. Cooling water will be recovered and used in rinsing and other processes, replacing fresh water. Vacuum pump sealing water will be returned back for reuse. And level and flow controls will be installed on the back water system.

All these improvements should be implemented by the end of 2010. The result will be a reduction of mill water usage from the current 12 m³ of water

per tonne of paper to only 5.5 m³. This represents a significant water savings: 490,000 m³ per year. Much more than a drop in the bucket.

Mill water consumption to be nearly halved



How to cut mill energy use

Our ongoing energy reduction measures



Like water reduction (see adjacent article), the goal of cutting energy consumption at paper mills needs to be approached from numerous angles. Here is a roundup of some of the measures being taken to achieve energy reduction goals at International Paper's European sites.

A starting point is to use more alternative fuels. A key candidate is biomass: by-products of tree harvesting (branches, bark and sawdust) and pulp production (black liquor).

Much can also be done by tweaking the paper and pulp manufacturing processes and equipment. The aim is to make machinery operate in less energy-hungry ways. For instance by combining capacity, and rationalising less efficient power plants and digesters.

Similarly, perfecting the installation and alignment of equipment can decrease the power consumption of

rotating machinery while improving its reliability. Reducing the air in boilers to optimum levels cuts their heat requirements. And better use of mill backpressure power by selectively heating feed-water reduces electricity consumption.

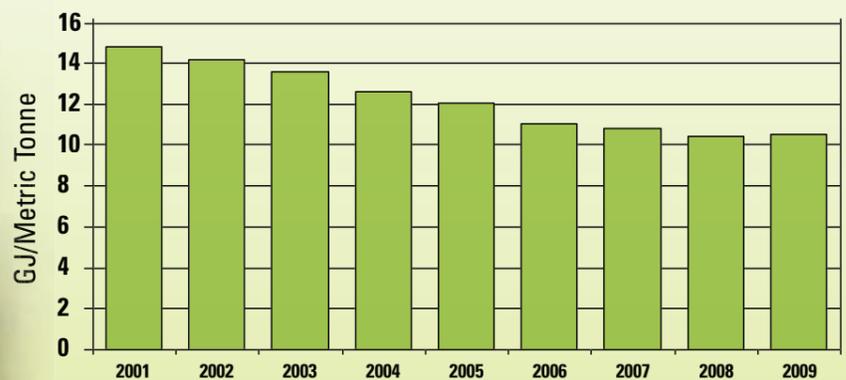
and other processes. Heat can also be recovered through new technologies for advanced control of recovery boiler soot-blowing, lime kilns and cooking processes.

Ongoing incremental improvements like these have led to an impressive overall drop in energy consumption at International Paper plants. Since 2001 the amount of purchased energy used per tonne of paper produced has fallen by 29% (see chart). This in turn has meant "greener" paper for our environmentally-conscious customers.

Don't lose it, reuse it

Additional energy efficiency gains can be achieved through finding clever ways to reuse energy instead of letting it disperse. Much heat and steam can be recycled from the evaporators, condensers, dryers and heat exchangers used in paper machines

International Paper: Purchased energy per tonne of paper (including purchased electricity)



Test your paper & forest knowledge

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From Scandinavia to Portugal, the British Isles to the Greek islands, Europe's forests offer much to its inhabitants. But how much do you really know about this precious natural resource? Find out with this fun, online quiz!

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International Paper is a global forest products, paper and packaging company with primary markets and manufacturing operations in the United States, Europe, Latin America, Russia, North Africa and Asia. With approximately 56,000 employees, the company was named No. 1 in

the forest products sector for the eighth consecutive year on Fortune magazine's Most Admired Companies list.

International Paper has a long-standing policy of using no wood from endangered forests. International Paper also supports

mutual recognition of forest certification standards. We have encouraged the adoption of the Forest Stewardship Council (FSC), CERFLOR, the SFI standard and other systems recognised by the global Programme for the Endorsement of Forest Certification (PEFC) council.

To find out more about International Paper's commitment to sustainable forest management visit www.internationalpaper.com.