Long-Term Agreements on energy efficiency in the Netherlands

Results for 2005
Long-term agreements on energy efficiency in the Netherlands

Results for 2005
Contents

Introduction 4
LTA2 explained 5
Supporting LTA 7
LTA results for 2005 9

This brochure contains the results of the Long-Term Agreements (LTAs) for energy efficiency for the year 2005. The report provides an overview of the energy saving measures taken by Dutch companies and the results they have achieved.
Better planning means less energy consumption

Efficient management and fewer stops and starts are the most effective ways that asphalt producers can cut energy consumption. So says Harry Roos of the trade organization VBW-Asfalt (a Dutch asphalt manufacturer). ‘Surveys have shown that changing the asphalt formula costs roughly 1500 MJ. So production with few interruptions yields considerable energy savings. But this depends entirely on good planning and using fewer formulas. Clients can also be of help by selecting smaller batches of different types of asphalt less often. The use of recycled asphalt received enormous stimulus when customers specified that twenty percent of asphalt should consist of recycled material.’

Other measures such using lower temperatures during production, also account for energy savings. Fred Cissen, head of the Heijmans asphalt plant says: ‘Normally, asphalt is heated to 170 degrees Celsius. For new experimental techniques, the production temperature is 90 degrees Celsius.’ Heijmans is also studying using the asphalt surface as a sun collector.
Since the early 1990s, the Ministry of Economic Affairs of the Netherlands has been making long-term agreements (or covenants) with various energy-intensive sectors as part of Dutch energy policy. The voluntary agreements, or LTAs, are aimed at promoting energy savings in the Netherlands. The education sector, healthcare institutions and a number of agricultural sectors followed suit a few years later, and joined the LTA scheme. The initial agreements with industry ended in 2000. However, due to the success of these so called first-generation LTAs (22.3% energy-efficiency improvements in ten years), the government and industry decided to sign new agreements, known as LTA2. This covenant spans 2001 to 2012.

Participation
The larger energy-intensive companies have not signed LTA2 but are instead participating in the Benchmark Covenant. Mostly medium-sized (and sometimes smaller) enterprises are taking part in LTA2. To qualify for participation in LTA2, a sector must use at least 1 PJ of energy annually, 80% of which should be consumed by the sector’s constituent companies. This report presents the results of LTA1, LTA2 and the GLAMI Covenant (which covers glasshouse horticulture and the environment).

Involved Parties
LTA2 is signed by three Dutch Government Ministers (Economic Affairs; Agriculture, Nature and Food Quality; Housing, Spatial Planning and the Environment), the provincial authorities, the Association of Dutch Local Authorities (VNG), the participating companies and relevant trade organizations.

LTA in 2005
2005 was a good year for the LTAs. All 908 LTA2 participants have jointly improved their energy efficiency by an average of 2.2%. The number of LTA2 companies is increasing on a yearly basis. In addition, some ten thousand companies in the agricultural sector are also participating in agreements where energy plays an important role. The total energy consumption of the participating companies in the industrial sectors totals 101,064 PJ in 2004, while that of the service sectors amounts to 39,425 PJ; the food sector consumes 43,987 PJ.

In addition to improving process efficiency the share of the so-called expansion themes is continually increasing within the LTA. Expansion themes (ETs) include activities such as: energy conservation unrelated to the immediate production process such as energy efficient product development (it’s more efficient to transport square than round bottles), collaboration in the chain and utilizing renewable energy.
LTA2 Explained

What is required of LTA2 companies?

1. Every four years, companies draft an energy conservation plan (ECP) which sets out the energy efficiency goals of each company, linked to concrete measures and an implementation plan.

2. Companies are obliged to implement so-called ‘good housekeeping’ savings measures. These are process efficiency measures that are financially profitable for companies (the costs can be recouped in less than five years).

3. Participants in LTA2 are obliged to introduce systematic energy care into their companies. Energy care is intended to encourage companies to remain consistently focused on their energy consumption. A method for uniformly assessing whether LTA2 companies are fully adhering to energy care principles has been developed.

4. Companies participating in LTA2 are obliged to strive to put the so-called expansion themes into practice. This involves working towards increasing the use of sustainable energy and saving energy through energy efficient product development. This report discusses companies’ performance in the area of expansion themes.

5. Participants in the LTAs must submit yearly reports on the progress they have made with implementing the Long-Term Agreements. This publication is a summary of progress made in the year 2005.

IN THIS REPORT
To give you a clear idea of how to equate the energy savings, we regularly give the number of households (averaging 2.2 individuals per household) followed by the number of petajoules saved (PJ), with the corresponding energy consumption. By way of illustration, we have also included seven interviews with representatives from participating companies, a trade organization employee and a representative of the Competent Authority. Each tells, in their own personal way, how they contribute to improving energy efficiency in the Netherlands. The enthusiastic accounts clearly show that improving energy efficiency is a task that has been taken up by inspired, dedicated people.
Transport plays a key role in the Dutch non-ferrous metals industry. A transport audit indicated that, with better planning, non-ferrous metals companies could save ten to fifteen percent of their transport costs on average while at the same time reducing CO2 emissions. BOAL Profielen, part of BOAL Extrusie, is one of the companies that were audited. Managing director Jan-Paul van den Bos: ‘We no longer produce on the basis of sales orders, but on the basis of the implementation of sales orders planned by our expedition department. Which sounds simpler than it is. We sometimes produce fifteen different profiles for a single client. And there’s always a risk that one will go wrong during the production process. So you have to allow for this in your production and transport schedule so there’s time to produce an order again. We’re now far more effective, having made a few adjustments to our planning software.’

Other energy saving measures include reducing scrap and using fewer raw materials.
SenterNovem, an agency of the Ministry of Economic Affairs, has been appointed by the Ministers of Economic Affairs and Agriculture, Nature and Food Quality to facilitate the long-term agreements as independent expert. SenterNovem supports the participating parties in implementing their covenant agreements. For instance, the companies can benefit from the expertise and experience of advisers. Companies and trade organizations are assisted in drawing up energy conservation plans and realizing energy savings. Another example is the advice SenterNovem, as independent expert, provides to provinces and local authorities (Competent Authorities) on the quality of the energy saving plans.

Specific instruments have been developed within the framework of the LTAs including the lists of measures, extensive energy studies, software packages and various ‘quick scans’ concerning product innovation, technology and sustainable energy.

Various aids have also been developed for implementing energy care. These instruments facilitate companies in actually shaping their efficiency improvements. These instruments support companies in giving concrete shape to efficiency improvements. In addition, with various trade organizations, SenterNovem also organizes user groups, knowledge network meetings and workshops for companies. These facilitate the exchange of know-how and experiences between companies both inside and outside the sector.

The LTA website (www.senternovem.nl/LTA) has been set up as a central information source for participants to the covenants and (electronic) newsletters are circulated on LTA in general and on specific topics such as energy care and expansion themes.

Finally, SenterNovem organizes various consultation structures involving companies, trade organizations, Competent Authorities and ministries. In addition to facilitating the implementation of the covenant, each year, SenterNovem carries out an audit, determining and presenting LTA results per sector. The current report contains the results of the 2005 audit.
Philips Nederland
Produces healthcare, lifestyle, and technology products.

‘We are constantly discovering new energy saving methods’

Philips (with branches in 150 countries and 135 production locations) places energy efficiency high on the agenda with worldwide programmes Ecovision and Ecodesign. With Ecovision, a worldwide programme aimed at environmental improvements, the company reduced one quarter of the energy consumed in work processes between 2002 and 2005. With Ecodesign, Philips aims to launch energy-saving products on the market, led by its sustainable success story low-energy lighting. Hennie Pouwels, environment coordinator at Philips in Eindhoven: “One third of Europe’s street lighting is out of date and consumes far too much energy. If we use a modern low-energy light like CosmoPolis for street lighting throughout Europe, we’ll save six to seven hundred millions of euro a year. And CO2 emissions will also drop by an annual 3.5 tons. Which brings us closer to reaching the Kyoto targets. There is still enormous potential for cutting back on energy consumption. We are constantly discovering new energy saving methods.’
In 2005 there were 34 sectors (and 47 branch organizations) participating in LTA covenants. Eight of those were participants in LTA1, 24 in LTA2 and there were two separate covenants (glass horticulture and higher professional education (HBO).

In 2005 68 companies signed up to LTA2. This included 17 potato processing companies, 7 flour manufacturers and 7 companies in the surface treatment industry. Companies also leave the LTA2 for various reasons bringing the total net number of LTA2 participants to 906 in 2005. In 2004, this was 907.

The table on pages 10 and 11 show the sectors that signed up to LTA2, which participate in LTA1 and which sectors and companies have joined the Benchmark Covenant. The higher professional education sector and glass horticulture branch each signed a separate covenant: the Sustainable Higher Education Charter and the Glass Horticulture and the Environment Covenant (GLAMI), respectively.
### Participating Sector

<table>
<thead>
<tr>
<th>Services</th>
<th>LTA1</th>
<th>LTA2</th>
<th>Benchmark-Convenant</th>
<th>No Convenant</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks (Netherlands Assoc. of Banks)</td>
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<tr>
<td>Higher professional education</td>
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<td>NS (Netherlands Railway)</td>
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<td>Supermarkets</td>
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<td>University Medical Centers</td>
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<td>Insurance companies</td>
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<td>Universities</td>
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<tr>
<td>Industrial</td>
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<td>Oil refineries</td>
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<td>Asphalt industry</td>
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<td>Cement industry</td>
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<td>Chemical industry</td>
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<td>Foundries</td>
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<td>Glass industry</td>
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<td>Coarse ceramics industry</td>
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<td>Iron and steel industry</td>
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<td>Laundry industry</td>
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<td>Sand-limestone industry and cellular concrete industry</td>
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<td>Refrigeration and cold-storage</td>
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<td>Non-ferrous metal industry</td>
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*Legend to table:*

- **= joined**

*Situation as per 31 December 2005*
<table>
<thead>
<tr>
<th>PARTICIPATING SECTOR</th>
<th>LTA1</th>
<th>LTA2</th>
<th>BENCHMARK-CONVENANT</th>
<th>NO CONVENANT</th>
<th>OTHER</th>
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<tr>
<td>Oil and gas production industry</td>
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<td>Surface treatment industry</td>
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<td>Non branch related industry</td>
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<td>Paper industry</td>
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<td>Philips *</td>
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<td>Rubber and plastics processing</td>
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<td>Tank storage industry</td>
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<td>Carpet industry</td>
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<td>Textile industry</td>
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<td><strong>Agricultural</strong></td>
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<td>Flower bulb growers</td>
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<td>Glasshouse horticulture</td>
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<td>Mushroom growers</td>
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<td><strong>Food</strong></td>
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<td>Potato processing industry</td>
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<td>Breweries *</td>
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<td>Cocoa industry</td>
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<td>Vegetable and fruit processing</td>
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<td>Coffee roasting industry</td>
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<td>Margarines, fats and oils</td>
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<td>Flour manufacturers</td>
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<td>Sugar industry</td>
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<td>Meat processing industry</td>
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<td>Dairy industry</td>
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(Situation as per 31 December 2005)

Legend to table:

- = joined

*= joined the non branch related industries
Monitoring participation
The LTA agreements state that every year, before 1 April at the latest, companies must provide SenterNovem with monitoring data. Sectors that joined LTA2 as a whole in 2004 (the sand-lime industry, potato processing industry and flour manufacturers) and a number of major companies that joined in that year (like Philips and Amsterdam Schiphol Airport) are taking part in the audit in 2005 for the first time.

LTA results
The graph on page.. presents an overview of results per sector. This shows the percentage of total energy efficiency improvement (TEEI) for 2005 and 2004, compared to the previous year. The total energy efficiency improvement as a result of energy saving measures is the sum of the savings gained in the monitoring year by:

1. energy efficiency measures applied by companies and their (internal and external) corporate influences (process efficiency);
2. the use of renewable energy (expansion theme);
3. measures taken by companies regarding energy efficient product development (expansion theme).
RESULTS PER SECTOR IN 2004 AND 2005 (IN %)

- Banks (Netherlands Assoc. of Banks) (1995)
- NS (Netherlands Railway) (1997)
- Supermarkets (1995)
- University Medical Centers (1998)
- Insurance companies (1996)
- Universities (1996)
- Asphalt industry
- Chemical industry
- Fine ceramics industry
- Foundries
- Coarse ceramics industry
- Laundry industry
- Sand-limestone industry and cellular concrete industry
- Refrigeration and cold-storage
- Non-ferrous metal industry
- Oil and gas production
- Surface-treatment industry and cellular concrete industry
- Non branch related industries
- Rubber and plastics processing
- Tank storage industry
- Carpet industry
- Textile industry
- Potato processing industry
- Cocoa industry (1995)
- Vegetable and fruit processing
- Coffee roasting industry
- Margarines, fats and oils
- Flour manufacturers (2004)
- Meat processing industry
- Dairy products

- Resultaat 2004
- Resultaat 2005
Expansion themes and energy care

Expansion themes
In addition to energy efficiency LTA2 also focuses on expansion themes (ETs). These include sustainable energy (SE) and energy saving production development (ESPD). SE is energy captured from sources such as the wind, water, sunshine, geothermal heat flows and biomass. ESPD focuses on conserving energy throughout the entire product life cycle chain. Examples of ESPD are: recycling materials, cutting back on materials and prolonging their lifespan. These savings can be realized both within and outside the company, for instance by collaboration in the product chain.

Results 2005
A company will first need to become familiar with the potentials offered by the ETs and draft plans before implementing the ET measures. Research (2006) shows that 73% of companies are thoroughly or adequately familiar with the ETs. This is a pronounced increase compared to earlier measurements (45%); awareness of ETs is also far higher than among the 24% of companies that do not participate in LTA.

Both the percentage of companies that take ET measures and the savings this generates, are mounting over the years. In 2005, 32% of the LTA2 companies were actively involved with ETs. This yielded a saving of 7 PJ (the equivalent of 84,000 households) which results in an energy efficiency improvement of 2.3% compared to 2004. 4 PJ of this saving was generated by energy efficient product development and 3 PJ by sustainable energy.

The energy efficiency improvements of companies that have quantified ET measures are given in the table on page 24. In this graph the line ‘ET secure’ shows energy efficiency improvements generated by applying ET measures, until 2005. The ‘total secure’ line represents improvements following from the application of measures relating both to process efficiency and ETs. The expectations outlined in the energy saving plans of the LTA companies have been included for the period 2006-2008. The splitting off of the lines after 2005 shows the margin between the energy efficiency improvement that is certain to be realized, and the maximum improvement possible (‘ET ambition’ and ‘total ambition’).

The graph clearly indicates that the group of companies applying ETs plays a crucial role in the energy savings already made, and those that are in the pipeline. Thanks to process efficiency, the application of ETs does not compromise savings, but generates extra energy conservation. This applies both to results achieved up to now, and to projected results. The possibility of the continued growth of companies that actively apply ETs offers considerable energy conservation potential for the near future.
**Total secure:** energy efficiency improvements realized (until 2006) and the energy efficiency improvements companies have indicated that are definitely being achieved (2006-2008) as a result of measures in the area of process efficiency and expansion themes.

**Total ambition:** the maximum achievable energy efficiency improvements as a result of measures in the area of process efficiency and expansion themes or ETs (2006-2008).

**ET secure:** the realized energy efficiency improvements (until 2006) and the energy efficiency improvements companies have indicated that are definitely being achieved (2006-2008) as a result of the expansion themes.

**ET ambition:** the maximum achievable energy efficiency improvements as a result of expansion theme measures (2006-2008).
Energy transition in the Netherlands

The government is working with market parties and social organizations on energy transition. This approach is intended to secure sustainable energy supplies within five years. The transition has three facets: conserving energy, securing renewable energy sources and using innovative technology. By pursuing expansion themes activities, the LTA2 companies are working towards each of these three aspects. They gain valuable experience as they achieve results, and prepare for the major transition steps. If you’d like to know more about energy transition, visit www.senternovem.nl/EnergyTransition.

Energy efficient product development

The results of the audit indicate that companies are becoming more aware of energy efficient product development (EEPD) and chain cooperation. Reviewing the type of measures companies are taking with regard to EEPD shows that a shift has taken place over the years. In 2001, over half of the EEPD measures related to more efficient use of materials such as narrower slats. In 2005, optimization of distribution and product reprocessing has figured more prominently among the measures applied. These are more complex measures, involving a larger number of partners in the chain and include strategies, one such example of which involves restructuring transport flows by setting up a joint distribution centre so that companies receive a total delivery from one central point rather than being furnished with supplies by each separate supplier. This can reduce the number of transports and hence the level of fuel consumption. This shows that, when they introduce ET measures, companies gradually venture to tackle more complicated changes. With this development, the LTA2 expansion theme policy can be typified as a fore-portal for energy transition.

Most important conclusions of the ETs

• LTA2 companies are more familiar with ETs than non-LTA companies.
• There is an increase in the number of LTA2 companies planning and implementing ET measures.
• The total savings generated by ETs are steadily increasing.
• In 2005, by implementing ETs, one third of the LTA2 companies realized a saving of 7 PJ.
• ET measures realized are becoming increasingly diverse and complex. With this, LTA2 companies are taking the first few steps towards energy transition.
Energy care
Implementing energy care is obligatory for all LTA2 participants. Energy care based on ISO norm 14001 assures structural attention for the energy consumption of production processes. Assessment criteria have been introduced to evaluate whether the participants have introduced energy care. The graph below shows a stable, upward trend in the percentage of LTA2 participants that meet these assessment criteria. At the end of 2005, 68% of companies have introduced energy care as opposed to 45% in the previous year. By the end of 2006 all companies are expected to fulfil the criterion. Participants who signed up in the last two years are not required to satisfy these assessment criteria. Never-theless, 36% of this group has already ushered in energy care. However, this has not fully realized the energy care goal of LTA2. A number of companies have encountered delays due in some cases to reorganizations, relocation of production or the prolonged illness of a key person. A major proportion of these companies have indicated that they will have fully integrated energy care in time for the 2006 audit.

Results per sector
Below is an overview of the results of LTA in 2004 for the various groups of sectors
- services
- industry sectors
- agriculture
- food
Most sectors have seen an improvement in total energy efficiency compared to 2004.
Service sectors
Participants: banks, NS (Netherlands Railway), supermarkets, insurance companies, universities.

Results 2005
In 2005, energy-efficiency in all joint service sectors participating in LTA improved by 6.5% compared to the various reference years of the separate sectors. This is a decrease in the energy-efficiency of these sectors by 1.2% points compared to 2004. The dissavings can also be expressed in PJ. The energy efficiency drop for the service sectors in 2005 is the equivalent of 0.2 PJ (2,400 households). The Netherlands Railway, university medical centres and insurance companies show a positive contribution. The banks, supermarkets and universities all show a deterioration.

Although the sectors have not undertaken to utilize sustainable energy, they source an amount of renewably generated energy, namely 3.4 PJ (41,000 households). The banks quadrupled their purchase of sustainably generated electricity while in 2005 the supermarkets only sourced a third of the amount compared to 2004.

Results in detail
The service sectors pursued energy efficiency measures amounting to 1.1 PJ. However, these savings were counterbalanced by two factors. Firstly, the relatively harsh winter which led to increased energy use, and secondly the ‘condensing’ and more intensive use of floor surface area which caused universities in particular to consume more energy per m² of floor surface area.

Many service areas determine their energy efficiency on the basis of the savings index (see the box on this page). This gives clearer insight into the efforts made by the sectors than the energy-efficiency index.

RESULTS SERVICE SECTORS IN 2004 AND 2005 (IN %)

<table>
<thead>
<tr>
<th>Service Sector</th>
<th>Results 2004</th>
<th>Results 2005</th>
</tr>
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<tbody>
<tr>
<td>Banks (1995)</td>
<td>-15</td>
<td>-10</td>
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<tr>
<td>NS (Netherlands Railway) (1997)</td>
<td>-10</td>
<td>-5</td>
</tr>
<tr>
<td>Supermarkets (1995)</td>
<td>-5</td>
<td>0</td>
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<td>University Hospitals (1998)</td>
<td>-5</td>
<td>0</td>
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<tr>
<td>Insurance companies (1996)</td>
<td>-10</td>
<td>-5</td>
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<tr>
<td>Universities (1996)</td>
<td>-15</td>
<td>-10</td>
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Results 2004 and 2005.
Law of large numbers

‘I firmly believe that personal attention can have a positive effect on influencing a company’s motivation to take energy saving measures. How do I motivate people? I give the topic of energy conservation a social significance, just as I do with external security. For instance, I translate the research results into the reduction of CO2 emissions and the benefits to the climate. It’s very effective,’ observes Egbert Dijk of Overijssel Province.

The province is the Competent Authority for larger companies in Overijssel.

Dijk analyzed measures contained in the energy saving plans for the period 2005 to 2008. ‘This shows that there’s room for improving energy efficiency by eleven to seventeen percent.’ The greatest gains can be made in the asphalt industry and in the rubber and plastics processing sector. The textile branch is faring less well because of competition from China. But there are possibilities: ‘The production of synthetic fibres for football fields, among other things, is gathering pace. This requires new machinery, which necessitates investments in energy efficiency.’
Determining energy efficiency in buildings (particularly in service sectors with a LTA1) originally took place on the grounds of energy efficiency improvements, the same method used in industry. This relates energy use to the gross surface area of the buildings.

The more accurately institutions monitored energy use, the clearer it became that, because of changes in the way buildings are used (such as flexi workstations in offices, more patients per m2 in hospitals, new privacy needs and the multiple uses of school buildings) the energy efficiency improvement percentage did not provide an accurate picture of the energy saved. So, alongside the energy efficiency improvement report, experiments began with a different reporting method, a ‘savings index’ (SI). This is the absolute saving in the monitoring year, related to the actual energy consumption in the sector in the reference year (1996, 2002 or 2003, depending on the sector). Higher Professional education use the Saving Index. In 2005 this sector have reduced energy by 11% compared to the reference year 2003. When contrasted with 2004 this is an increase of 5%.

The key energy efficiency measures in 2005 are:
- the use of TFT monitors;
- buying of restainable energy;
- the use of energy saving office equipment;
- the use of energy caresystem.

In 2005 energy efficiency in the banks sector increased by 5% compared to the reference year 1995. The key energy efficiency measures in 2005 are:
- renovation and construction;
- adjustments to systems.

In the meantime, banks are sourcing 43% of their energy needs from sustainably generated energy. This was not taken into account in LTA1. If that had been the case (as in LTA2) the total energy efficiency index would have been 48%. The share of renewably generated energy increases in 2005 from 15% to 43%. All the social annual reports of the participating banks refer to Corporate Social Responsibility (CSR) which also includes using renewable energy. With this, the sector is in line with international regulations and indexes (GRI indicators) that have been agreed for CSR.

In 2005 the Nederlandse Spoorwegen (NS, Netherlands Railway) improved energy efficiency by 17% compared to the reference year 1997. With this, the NS has more than achieved its goal of 11% energy efficiency in 2010. The NS is also making excellent progress towards realizing its new ambition of a 20% improvement in energy efficiency. Compared to 2004, there is a gain of 4%. In 2005, various energy conservation measures were carried out, the most important of which (jointly responsible for some 85% of total energy savings) are:
- using new double-deckers and modernizing sprinters;
- lowering temperature and adjusting ventilation in Intercity trains and double-deckers;
- optimizing the recouping of brake energy.

Compared to 1997, in 2005 NS improved its use of sustainable energy sources by 2.7%. The section of the company known as NS Reizigers will begin to integrate EnergyEfficientDriving in trains in early 2006, starting with adjusting the training and on-the-job training provided to engine drivers. Parallel to this, from 2007 NS Reizigers will take part in TRAINER, a European project that focuses on training engine drivers in Energy-EfficientDriving.

Dutch supermarkets saw a rise in energy efficiency of 3% compared to the reference year 1995. When contrasted with 2004 this is a decrease of 1.7%. In 2005, the most important energy efficiency measures are:
- applications relating to refrigeration and cooling (0.037 PJ, 750 households).
By, among other things, applying energy efficient cooling equipment;
• applications relating to lighting (0.017 PJ, 200 households). By, among other things, dividing them into a larger number of switch groups;
• applications relating to heating (0.018 PJ). By, among other things, replacing heating systems.

The use of heat pumps and recouping residual warmth from the refrigerating systems is gradually making inroads in the sector. Organic and seasonal products are being promoted by the sector and account for the sector’s improved energy and environmental performance.

Energy efficiency (per m2) in the university medical centres has dropped by 9.4% compared to the reference year 1998. More intensive use of the space available primarily accounts for the greater use of energy per square metre. The most important energy saving measures in 2005 are:
• renovation and construction;
• adjusting systems, including total energy boilers;
• increasing COP chillersystems.
In 2005 a survey into central distribution centres was rounded off. The results indicate that a collaboration between the regional distribution centres (of which there are roughly thirteen) for the eight university medical centres with the 86 other hospital organizations would be highly effective. Such an approach would net energy savings of roughly 5%. There are signs that commercial distribution companies are keen to develop this further. The sourcing benefits have not yet been calculated.

The total energy efficiency of Dutch insurance companies has improved by 3.2% compared to the reference year 1996. Compared to 2004 this is an improvement of 4.8%. The share of renewably generated energy increases in 2005 to 6% of the total energy use. In their social annual report, a number of companies mention Corporate Social Responsibility (CSR). With this, the sector is in line with international regulations, including the ‘Equator Principles’ that have been agreed for CSR (http://www.equator-principles.com/).

On 1 October 2004 a chair in Sustainability and Financial Institutions was appointed to the Faculty of Economic Sciences at the University of Groningen. The professor will primarily focus on stimulating research and education in the field of sustainable or socially responsible financing and investing, partly from the perspective of the financial institutions, specifically insurance companies. The chair was founded by the Dutch Association of Insurers and receives financial support from this organization.

In the universities sector total energy efficiency dwindled by 0.5% compared to the reference year 1996. Compared to 2004, there is a backslide of 0.2%. Although this is not evident in total energy efficiency, the sector saved energy totalling almost 0.28 PJ (3.400 households) with the realization of around seventy measures. This corresponds to a quantity of natural gas amounting to 870,000 m3. The most important energy conservation measures in 2005 are:
• the generation of wind energy;
• the replacement of existing buildings by new ones;
• the application of a space heating optimization regulation.
Encouraging staff to be responsible

In 2005, SNS REAAL (3,462 employees in Nederland, 165 offices) started the Sustainable Air Conditioning Systems project for bank branches. In the same year, they launched the project Sustainable Lighting Systems for bank branches and head offices. The company has been using green electricity at all its locations since 2006. SNS Reaal’s Sustainability Adviser Agnes Otten remarks: ‘These are just two of the 36 projects on sustainability that we’ve started. The Sustainability Platform was founded to think about and decide on new initiatives. We engage our staff in the process by setting up working groups. We want to make it clear to our workforce that they are jointly responsible for energy efficiency. So we publish a newsletter with information about action they can take themselves. Like turning their computers off at the end of the day, rather than leaving them on standby.”
**Industrial sectors**

Participants: asphalt industry, chemical industry, fine ceramics, foundries, coarse ceramics, laundries, sand-lime industry and cellular concrete industry, refrigeration and cold-storage facilities, non-ferrous metal industry, oil and gas production industry, surface-treatment industry, non branch related industries, rubber and plastics processing, tank storage companies, carpet industry and textile industry

**Results 2005**

In 2005, the industrial sectors in the Netherlands that participate in LTA2 achieved a total energy efficiency improvement of 19.1% compared to the reference year 1998. This includes sustainable energy and energy efficient product development. With this, the industry scores 3% points higher than in 2004, when total efficiency improvements totalled 16.1% in contrast with 1998. 66% of the energy efficiency improvements can be attributed to process efficiency (direct improvements to the production process), 13% to the use of renewable energy and 21% to energy efficient product development.

The rubber and plastics processing sector, tank storage companies, carpet industry and textile industry are responsible for a distinct upswing in process efficiency. The refrigeration and cold-storage facilities show a decline in this regard.

Compared to 2004, the improvement in these sectors corresponds to an absolute saving of 1.1 PJ (13,000 households). Like last year, the chemical industry and rubber and plastics processing sector make considerable

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**RESULTS INDUSTRIAL SECTORS IN 2004 AND 2005 (IN %)**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Results 2004</th>
<th>Results 2005</th>
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<tbody>
<tr>
<td>Asphalt industry</td>
<td></td>
<td></td>
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<td>Chemical industry</td>
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<td>Fine ceramics</td>
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<td>Foundries</td>
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<td>Coarse ceramic</td>
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<td>Laundries</td>
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<td>Sand-lime industry and cellular concrete industry</td>
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<td>Refrigeration and cold-storage facilities</td>
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<tr>
<td>Non-ferrous metal industry</td>
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<td>Oil and gas production industry</td>
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<tr>
<td>Surface-treatment industry</td>
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<td>Non branch related industries</td>
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<td>Rubber and plastics processing</td>
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<td>Tank storage companies</td>
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<td>Carpet industry</td>
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<td>Textile industry</td>
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use of renewable energy. In the ‘other industry’ sector the use of renewable energy in 2005 exceeds levels in 2003, after a sharp downturn in 2004. Energy efficient product development is undergoing a remarkable development. In the asphalt industry, coarse ceramics industry, non-ferrous metal industry, other industry and rubber and plastics processing, the size of the savings netted in projects carried out in the production chain have doubled.

Results in detail
A large proportion of this total energy efficiency improvement (TEEI) is a consequence of the efforts companies have made in the field of sustainable energy and energy efficient product development. This yields, respectively, 0.6% points and 1.7% points. Process efficiency has improved by 0.8% points, constitutes a less distinct rise than in 2004. In a number of sectors, energy efficiency has worsened when compared to 2004. Improvements in process efficiency can largely be ascribed to energy saving measures. Further, a large number of - positive and negative - factors play a role. Just as in other years, companies are facing the uncertain consequences of changes in scale and manpower. In general these can result in the following:
• greater use of energy per product unit by extending production time by introducing extra shifts, with the consequence of poorer levels of manpower;
• less energy use per product unit by extending the production run by better planning;
• less energy use per product unit by closing one production line, resulting in better staffing of other production lines.
In 2005, this had a positive influence on the chemical industry and the foundries, while having a detrimental impact on the other industry sector and the rubber and plastics processing sector. The consequences of changing product specifications for efficiency changes were not advantageous in 2005. Changing product specifications is understood to mean the following, for example:
• changes in energy use by tightening up specifications for an obsolete product;
• production of narrower slats by using a heavier press that consumes more energy.
The rubber and plastic processing industry and the textile sector are facing this development. Companies signing up to, or leaving (institutions), LTA2 leads on balance, to dissavings. The non-ferrous metal industry in particular is encountering the adverse effects of changes to the composition of the group of companies, while the impact of this on the other industry sector was positive in 2005.

In the asphalt industry total energy efficiency improvement is 14.5% in comparison with the reference year 1998. Compared to 2004 this is a gain of 5%. Besides the efficiency measures, recycling used asphalt was the key expansion theme, providing an energy saving in the chain of over 0.150 PJ (1,800 households). A second measure is the application of asphalt as a sunlight collector. In 2005 this measure yielded a saving of almost 0.024 PJ (290 households). The application of ‘low temperature asphalt’ can, in due time, result in considerable energy savings, but for the time being, clients are reticent about allowing the use of this new type of asphalt in the renovation of existing roadways or in the construction of new ones.

The chemical industry achieved an energy efficiency improvement of 20.6% compared to the reference year 1998. In contrast to 2004 this is an increase of 5.4%. Measures are being pursued to improve process efficiency, and have yielded a saving of 0.342 PJ (4,100 households). The most sizeable savings were realized by optimizing processes. In the field of the expansion themes, 0.374 PJ (4,500 households) - another considerable saving - was generated. This was due in the main
to using sustainable energy. The trade organization actively encourages companies to pursue sustainable business practice in the context of the ‘Product Stewardship’ programme.

In the fine ceramics industry total energy efficiency improved by 6.1% with regard to the reference year 1998. When compared to 2004 this is an improvement of 4.2%. The most important energy-efficiency measures in 2005 are:

- the reduction of under-staffing by making better use of production means;
- the implementation of process efficiency measures such as improving furnace operation and reducing production discontinuities.

In 2005 the foundries sector succeed in improving process efficiency in the sector by 1.2%. But the lapsing of measures on sustainable energy and energy efficient product development only enhances total energy efficiency in 2005 by 0.1% compared to 2004. Furthermore, the fusion of two companies has led to the far more efficient production of almost the same range of products. The high energy prices continue to compel companies to cut energy consumption further.

In the coarse ceramics industry sector, total energy efficiency is up by 15.8% compared to the reference year 1998. In contrast with 2004 this is an upswing of 4.7%. Thanks to the high proportion of energy costs and the total costs, the sector focused intensively on energy conservation. Not only on their own location but also through dematerialization, which requires fewer raw materials and less transport. The most important energy-efficiency measures in 2005 are:

- the improvement of manpower;
- an optimized production process thanks to shorter drying programmers and shorter stoking times;
- the application of frequency regulations and high efficiency engines.

The laundries sector achieves a total improvement in energy efficiency of 17.4% compared to the reference year 1998. In comparison with 2004 this is a development of 3.9%. The bulk of savings in 2005 are generated through process efficiency. In total, this accounts for a saving of 0.050 PJ (600 households). The further optimization of the washing and drying process has also contributed to this. The savings realized by applying the expansion themes rise considerably in 2005. In 2004 this totalled only 0.003 PJ (36 households), in 2005 0.028 PJ (340 households). The additional focus on the expansion themes in this audit round has clearly had a positive effect. The trade organization began a project in 2005 that aims to conserve energy with energy efficient product design in the textile chain.

The energy efficiency of the sand-lime and cellular concrete industry is up by 1.1%. The situation in the sector changed so thoroughly between 2001 and 2003 that it was decided to take 2004 as a new reference year. In 2005, total energy efficiency improved by 1.1% compared to the reference year 2004. This sector later signed up to a LTA.

The refrigeration and cold-storage facilities achieve a total energy efficiency improvement of 9% compared to the reference year 1998. In contrast with 2004 this is a downturn of 1.6% for which manpower, processing times and air conditioning are primarily responsible. Filling and switching off units wherever possible cannot prevent the deterioration in energy efficiency. In 2005, the companies undertake a total of 91 relevant projects with a total saving of 0.029 PJ (350 households). The accent lies on:

- good housekeeping, such as improved air chill systems and adjusting the refrigeration unit (0.007 PJ, 84 households);
- process use, such as replacing old refrigeration units (0.003 PJ, 36 households);
- utilities, such as replacing old central heating systems (0.001 PJ, 12 households).
With this, 79 fewer projects were implemented than in 2004, and 0.020 PJ less energy was saved. (240 households).

The loss of the largest secondary smelt furnace, which operated highly efficiently, adversely affected the results of the metal industry. Total energy efficiency in 2005 is up by 13.9% compared to the reference year 1998. Compared to 2004 (excluding the secondary smelt furnace) this is a betterment of 3.4%. The most important energy-efficiency measures in 2005 are:

- the application of energy efficient burners;
- increasing materials yield;
- increasing production;
- measures relating to managing the zero load.

In 2005 the Dutch oil and gas production industry increases its efficiency by 0.9% compared to 2004. When contrasted against the reference year 1998 this shows a total energy efficiency improvement of 19.9%. In 2005, 17 measures were carried out in the area of process efficiency and energy care. This brings the total savings generated by improving process efficiency in the period from 1998 to 2005 to 5.3 PJ (64,000 households). The 2006 audit is expected to include a number of new savings measures in the framework of the expansion themes. Utilizing the residual warmth generated by cooling condensed natural gas to heat a neighbouring swimming pool affords a saving of 0.005 PJ (60 households) in 2005. The surface treatment industry enhances total energy efficiency with 5.9% compared to the reference year 1998. Seen against 2004 this is an increase of 2.1%. The key energy-efficiency measures taken relate to process efficiency:

- the optimization of production processes including drying kilns, renewing process baths and applying high efficiency electrical engines;
- good housekeeping, such as reducing compressed air leaks;
- the optimization of buildings through insulation and better central heating boilers.

Thanks to knowledge sharing projects, the importance of energy efficiency has been clearly impressed on the companies in the sector. The non branch related industries cover a variety of companies producing such products as beer, lorries, confectionary, photocopying machines, recycling and services such as broadcasting and aviation.

In this sector, total energy efficiency rises by 14.0% compared to the reference year 1998. In contrast with 2004 this is an increase of 3.6%. In 2005 a total of 1 PJ (11,700 households) of energy savings are generated by taking measures, of which 0.282 PJ (3,400 households) were yielded by measures within the company. The sector is also striving to encourage projects throughout the branch, such as a project on transport savings in 2005. The application of expansion themes accounts for roughly 70% of the 1 PJ (0.7 PJ, 8,200 households) resulting from the above-mentioned energy saving measures in the sector. Of these, sustainable energy comprises about half. This is a considerable proportion.

Total energy efficiency in the rubber and plastics processing industry makes a gain of 36.6% compared to the reference year 1998. Contrasted with 2004 this is an improvement of 8.9%. In 2005 energy savings of 3.25 PJ (39,000 households) were generated by energy conservation measures. This saving comprises 0.44 PJ (5,300 households), achieved by implementing process efficiency measures and 2.81 PJ (34,000 households), accomplished by new measures introduced in the context of the expansion themes.

The tank storage companies increase their energy efficiency by 17.3% as regards the reference year 1998. In contrast with 2004 this is an upswing of 8.5%.
The most important energy-efficiency measures in 2005 are:
- the optimization and computerization of temperature control;
- the application of a smoke gas condenser behind the boiler;
- the replacement of current steam heating by a more efficient system.

Total energy efficiency in the carpet industry in 2005 is enhanced by 56.3% compared to the reference year 1998. Contrasted with 2004 this is an improvement of 12.7%. In the area of process efficiency 37 measures have been taken, resulting in a total saving of 0.011 PJ (130 households). The most important measures in 2005 were realized through expansion themes:
- recycling carpet waste;
- sustainable energy, with the emphasis on green electricity.

In the field of renewable energy, a total saving of 0.073 PJ was achieved (875 households) and with energy efficient product development a total energy cutback of 0.157 PJ was reached (1,900 households).

In 2005 the trade organization carried out a survey into transport and logistics to gain a clear picture of the opportunities.

The textile industry steps up energy efficiency by 10.9% compared to the reference year 1998. In contrast with 2004 this is an enhancement of 6.5%. In the area of process efficiency and energy care, 95 measures are pursued with a total saving of 0.03 PJ (360 households). The most important energy conservation methods in 2005 related to process optimization and the convergence of production locations. Other measures include investing in new compressors, automating air conditioning systems and gas-fired driers, which makes a vital contribution towards total energy savings.
Agricultural sectors

Participants: glasshouse horticulture, flower bulb growers, mushrooms growers,

Results 2005

Of all three of the agricultural sectors (glasshouse horticulture, flower bulb growers, mushrooms growers) glasshouse horticulture is the largest energy consumer. Various types of energy are used in glasshouse horticulture: natural gas, oil, electricity, residual warmth from electricity generators and the warmth from energy companies’ Combined Heat and Power CHP. They use their own Combined Heat and Power CHP for warmth and electricity production.

An estimate of the energy improvements for 2004 and 2005 for the glass horticulture sector is not provided as measurement and allocation problems make it impossible to determine a reliable overview of gas consumption for the sector as a whole. However, for 2004 developments in the use of energy saving measures and energy intensifying activities have been mapped out. Data on residual warmth projects, cold and warmth storage projects and energy cluster projects is also available for 2005.

In contrast to the reference year 1995, the flower bulb growers have stepped up their total energy efficiency in 2005 by 22.7%. With this, the sector achieved its LTA objective of enhancing energy efficiency by 22% in 2005 compared to 1995. Three groups are monitored in the flower bulb cultivation sector. Given the representative nature of the monitoring data only one of these groups is used. In 2005, this group improved energy efficiency by 4.4% points compared to 2004. The stagnating market and lower prices have reduced investment in new buildings. Investing in new buildings also involves applying energy saving techniques. Despite these unfavourable developments, the sector has realized the above-mentioned positive (audit) result. The covenant period was extended in mutual consultation by one year, until 31 December 2006.

In 2005, the mushrooms growers accomplish a total energy efficiency improvement of 25.8% seen against the reference year 1995. Energy efficiency rose by 0.7% points in 2005 compared to 2004. Given the proportion allocated to climate control in energy consumption, like last year, this is the area that offers the most opportunities for energy conservation and quality enhancement. Introducing new modules to the air conditioning computers used by cultivation companies continues to be crucial. However, this requires an investment that must be profitable to the growers, because of which, demonstrations involving the suppliers of air conditioning systems, are offered. The mushroom growers have decided to extend the covenant period by one year, to the end of 2006.

<table>
<thead>
<tr>
<th>Agricultural Sectors</th>
<th>Reference year</th>
<th>Energy consumption reference year (PJ)</th>
<th>Total energy consumption (PJ)</th>
<th>Energy efficiency improvement reference year 2005</th>
<th>Share sustainable energy %</th>
<th>Total energy efficiency improvement (TEEV in %) reference year 2004</th>
</tr>
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<tbody>
<tr>
<td>Glasshouse horticulture</td>
<td>1980</td>
<td>108,9</td>
<td>dnya</td>
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<tr>
<td>Flower bulbs growers</td>
<td>1995</td>
<td>3,0</td>
<td>dnya *</td>
<td>22,7</td>
<td>4,18</td>
<td>-</td>
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<tr>
<td>Mushroom growers</td>
<td>1995</td>
<td>1,05</td>
<td>0,87 **</td>
<td>25,8</td>
<td>2,5</td>
<td>-</td>
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dnya = data not yet available  * in 2004 this was 3,8 PJ  ** this concerns the data from the audit of the LTA participants.

LTA comprises 1% of the total cultivation area.
Potato peelings make environmentally friendly fuel

The Dutch potato processing industry is the world’s largest sector, second only to the United States. The branch exports ninety percent of its products to countries within, and outside, the European Union. Thereby making transportation one of the largest expenses. Hans Leerssen, secretary of the Potato Processing Industry Association (VAVI) comments: ‘Our companies work 24 hours a day, seven days a week. The companies prefer to drive at night with larger trucks, known as train carriages. This way, we can transport large quantities of potatoes in the small hours. We are also investigating alternative types of fuel for our lorries. At the moment, the residue left by steamed potato peelings is largely used for cattle food. But this will probably change along with the disappearance of cattle food in due course. A good alternative is to ferment the peelings in a biogas system, which will save on mileage and transport costs. In addition, the branch is working with SenterNovem to see whether the number of Combined Heat and Power CHP in the sector can be expanded.’
A plan for the environment, and for energy conservation

Campina is a cooperative that was founded, and is owned, by around 8,400 members/dairy farmers. The producer of a selection of dairy products including milk, cheese, butter, yoghurt, puddings and ingredients for the foodstuffs and pharmaceutical industry has an annual turnover of 3.6 billion euro a year. With this Campina is a major player, worldwide, in the dairy sector. Campina has been working with the ECEP, a plan combining the energy conservation plan (ECP) and the environmental plan. Jaap Petraeus, the dairy company’s group environmental coordinator says: ‘We used to have to set out our environmental plans in a report for the Ministry of Housing, Spatial Planning and the Environment every four years, and submit an ECP to SenterNovem every four years. Now we only have one, combined, plan, the ECEP. The new working method is working well. It’s cut our administrative burden and there is little debate on the content of the plan. It would be more effective if the local authorities also took an integral approach to the ECEP, but they still have a little way to go yet, unfortunately.’
Food industry
Participants: potato processing industry, cocoa industry, vegetable and fruit processing, coffee roasting industry, margarine, oils and fats industry, flour manufacturers, meat processing, dairy industry

Results in 2005
Compared to the reference year 1998, in the food industry, the total energy efficiency improvement, including sustainable energy and energy efficient product development remained, at 5.63%, almost the same as last year (5.59%). The limited change in process efficiency in 2005 compared to 2004 in these sectors corresponds to an energy saving of 0.7 PJ (8,500 households). In the food industry, 83% of the total energy efficiency improvement was realized by process efficiency, 14% by the application of sustainable energy and 3% by energy efficient product development. The potato processing industry, which took part in the audit for the first time after recently signing up, and the coffee roasting industry, together account for almost 90% of renewable energy consumption in the food industry.

Results in detail
The efficiency improvement in the food industry can generally be attributed to energy conservation measures. Despite these steps, the savings were generally undermined by external developments that required stepping up energy consumption such as the trend for products with a high added value (pre-packaged products, ready-meals) and using smaller packaging units (one-person servings). More stringent legislation (largely occupational health and safety regulations) also brings about greater energy consumption. The food industry is also dealing with fluctuations in the quality and quantity of raw materials. Reduced manpower and the poorer composition of raw materials are contributing factors in a less efficient process.

In the potato processing industry total energy efficiency in 2005 is up by 3.2% compared to the reference year 1998. Contrasted with 2004 this means a deterioration of 3.7%. In 2005, the companies implement a total of twenty energy saving measures that generate 0.20 PJ of energy savings (2,400 households). The dry matter content of potatoes has a great impact on the companies’ energy consumption. The low dry

<table>
<thead>
<tr>
<th>RESULTS FOOD INDUSTRY 2004 AND 2005 (IN %)</th>
</tr>
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<tbody>
<tr>
<td>Potato processing industry</td>
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<tr>
<td>Cocoa industry (1995)</td>
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<tr>
<td>Vegetable and fruit processing industry</td>
</tr>
<tr>
<td>Coffee roasting industry</td>
</tr>
<tr>
<td>Margarine, oils and fats industry</td>
</tr>
<tr>
<td>Flour manufacturers (2004)</td>
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<tr>
<td>Meat processing industry</td>
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<tr>
<td>Dairy industry</td>
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Results 2004
Results 2005
matter potato content of 2005 in tandem with the high dry matter content of the end product leads to stepping up the production process. Amended product specifications also result in further minor changes. This counterbalances the effect of the energy conservation measures implemented, resulting in a drop in energy efficiency.

In the cocoa industry energy efficiency improves by 24.4% compared to the reference year 1995. In contrast with 2004 this is a betterment of 0.3%. This result can be attributed to an increase in bean processing which facilitates more efficient input in the production line. The LTA of the Dutch cocoa industry achieved a total objective of 18% for energy efficiency improvement from 1995-2005 on the basis of secure measures, compared to 1995. This corresponds with an energy saving of 0.390 PJ. At the end of 2005, the result stands at 24.4%. This is the equivalent of an energy saving of 0.749 PJ (9,000 households). With this, the LTA objective has been more than realized.

A total energy efficiency of 3.3% compared to the reference year 1998 for the vegetable and fruit processing industry represents a backslide of 3%. Vegetable and fruit processing companies pursue more energy-conservation measures in 2005 than in 2004. Absolute energy savings are also higher. The most important measures are:

- the adjustment of freezers and the installation of new freezing lines;
- the installation of the applesause chillerline;
- the replacement of steam blanchers;
- divers good housekeeping measures, such as lowering the pressure of steam boilers in the weekend and re-routing condensation to the steam boiler.

Adjustments to companies’ production lines, aimed at more energy efficient production, leads to a drop in efficiency during the start-up phase.

The coffee roasting industry steps up its total energy efficiency in 2005 by 30.3% compared to the reference year 1998. When contrasted with 2004 this is an improvement of 14.8%. The coffee roasting industry implements a total of twenty projects in 2005. This results in a total saving of 0.234 PJ (2,800 households). By auditing filter pad production separately to vacuum production, energy efficiency improves. This production is more energy efficient now that the rapid development of production capacity has stabilized. The energy efficiency improvement of 4.7% in 2005 is, alongside the impact of the savings measures, partially accountable for this development.

In 2005, the margarine, oils and fats industry realizes a total energy efficiency of 3.7% compared to the reference year 1998. Contrasted with 2004 this is an improvement of 2.4%. In total the sector pursued 57 energy saving measures which generate a saving of 0.293 PJ (3,500 households). The saving generated is partly invalidated by factors such as fluctuations in the quality of the composition of raw materials.

In 2005, the most important energy-efficiency measures are:

- the optimization of the production process (optimizing refinement, continuous food deodorization, improvement of dry fractioning and the installation of a spiral heater);
- the optimization of utilities (improved manpower, turbine condensation pot optimization and steam pressure regulation, pre-heating boiler feeder water).

In terms of total energy efficiency, with 18.2% the flour manufacturers perform less well compared to the reference year 1998. When contrasted to 2004, this is a deterioration of 11.5%. Energy efficiency is impacted by reduced production volumes and the corresponding reduction in manpower. Product innovations also accounted for increased energy consumption in the sector. Twelve measures were implemented in the
area of process efficiency and energy care with a savings total of 0.005 PJ (60 households).

Total energy efficiency in the meat processing industry improves with 7.6% compared to the reference year 1998. In contrast with 2004 this is an improvement of 3%. In total, 198 measures were taken in the area of process efficiency and energy care with a total saving of 0.06 PJ (720 households). The most important energy conservation measures in 2005 were actualized with regard to processing, and in the area of utilities and buildings. Some of the most striking examples are:

- the optimization of the production line;
- adjusting the regulation of the cooling towers’ compressor;
- the use of an operating system for the refrigeration units and chilled areas that runs in tandem with working hours.

The dairy industry steps up its total energy efficiency in 2005 by 4.8% compared to the reference year 1998. In contrast with 2004 this is a development of 0.2%. In 2005 a total of 211 measures were taken in the area of process efficiency and energy care that yields a saving of 0.201 PJ (2.400 households). The high energy prices mean that saving energy is a priority high on the companies’ agenda. Various factors have had a detrimental influence on energy efficiency and partially invalidate the benefits of any energy conservation measures. Companies often cite the decreasing demand of the market, which leads to reduced manpower and, in turn, poor staffing of production lines. The closure of production lines and production locations and the starting up of production elsewhere has also had an adverse impact on energy savings. More concentration on production and production locations is ultimately expected to have a positive effect on energy consumption.
Acknowledgements

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