



Local Investment Programmes

The way to a sustainable society



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Sweden's commitment to sustainable development

“Sweden should be a pioneer in the efforts to achieve ecologically sustainable development,” declared Göran Persson, the Swedish Prime Minister, in the governmental declaration at the opening of Parliament in 1996. The Government allocated SEK 6.2 billion for Local Investments Programmes (LIP) to support the process of change needed to achieve sustainable development. This is the largest investment in ecological sustainability to date in Sweden. As a result, over half of all municipalities in Sweden received LIP grants between 1998 and 2002. The precursors of LIP included the incentive grants awarded in the mid-1990s to implement municipal Agenda 21 plans.

The environmental impacts described here summarise the expected results set out by municipalities in their applications. The first programmes have been concluded and reported on; the last will not end until 2005 at the earliest. Only then will it be possible to summarise LIP.

The aims of LIP are:

- to achieve environmental improvements in Swedish municipalities
- to increase investment in sustainable infrastructure and technology
- to improve knowledge about ecologically sustainable development
- to help to ensure that sustainability is given higher priority in local efforts
- to encourage all actors in society to work together to achieve sustainable development
- to create job opportunities.

Each investment programme combines a number of measures; the results are environmental improvements, new jobs and a more rapid changeover to a sustainable society. Originally the Government decided grant applications; since 2002 LIP funding is decided by the Swedish EPA.

LIP in figures

The figures below are based on the number of successful applications.

Added to the recipients' own funding, **SEK 6.2 billion** in grants gives a total investment of **SEK 27.3 billion**, of which **SEK 21 billion** relates directly to the environment.

161 municipalities and 2 local federations have received grants for **1,814** measures leading to a more sustainable society, creating **20,000** full-time jobs.

An overall approach for greater environmental benefits

One of the basic ideas of LIP is to award grants to entire action programmes, not to individual projects in various sectors, which is otherwise a common feature of government grants.

Projects and investments are planned and given priority on the basis of municipal analyses of the local environmental situation and the scope for actually improving it. Although the number of projects varies under different programmes, there is always a requirement that the various measures should form a coherent whole and reflect the environmental situation in the municipality. LIP should also encourage creativity and innovation and result in tailor-made solutions for the local area, instead of the Government deciding in detail what should be done. The idea of supporting entire programmes is also that this will involve cooperation between projects, and the overall effect of the measures will be greater than if they had been taken separately.

Municipalities receiving grants must also present the impact of the programme on employment and its effect on new technology, equal opportunities, architectural qualities and cultural heritage.

Intense competition

Competition for LIP funding has been intense; only the best programmes have been awarded grants. Those previously engaged in systematic work in the environmental field have had an advantage in the LIP context, and those who have managed to combine programme measures with existing plans,

environmental strategies and long-term objectives have also had the greatest success in competing for LIP funding.

Focus on the local environment

LIP places municipalities and local ideas at the centre. The regulations governing grants focus on results and impacts, not on choice of technology or specific project areas; ideas and priorities are those put forward by the municipalities themselves.

There is great variation between the action taken and the focus of the investment programmes. The main requirement is that the measures should reduce the environmental burden or lead to more efficient use of energy and natural resources. Measures favouring the use of renewable raw materials, re-use and recycling have qualified for grants, as have investments promoting biodiversity or helping to improve the circulation of plant nutrients.

The Swedish Parliament adopted fifteen national environmental quality objectives in 1999. The aim is that the major environmental problems we face should be solved within a generation. Action taken under LIP produces a large number of positive effects on the environment and is relevant to virtually all the environmental quality objectives.

Allocation of grants

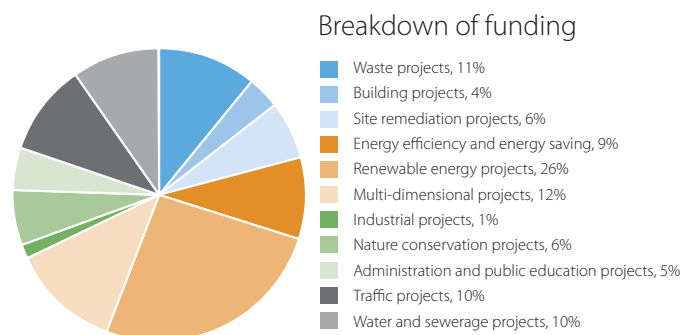
Over a third of the LIP grants have been allocated to projects involving a changeover to renewable energy sources, improved energy efficiency and energy saving resulting in sustainable heating systems and reduced use of fossil fuels and electricity.

The fifteen environmental quality objectives

1. Reduced Climate Impact
2. Clean Air
3. Natural Acidification Only
4. A Non-Toxic Environment
5. A Protective Ozone Layer
6. A Safe Radiation Environment
7. Zero Eutrophication
8. Flourishing Lakes and Streams
9. Good-Quality Groundwater
10. A Balanced Marine Environment, Flourishing Coastal Areas and Archipelagos
11. Thriving Wetlands
12. Sustainable Forests
13. A Varied Agricultural Landscape
14. A Magnificent Mountain Landscape
15. A Good Built Environment

Just over one tenth of the grants have been awarded to “multi-dimensional” projects: measures in housing areas or other buildings where alterations are made to achieve sustainability. In several instances the outdoor environment is included in the measures taken. The positive environmental effects of the projects cover several areas, such as energy use, water, sewerage and waste.

Projects in the fields of waste, transport, water and sewerage also received approximately one tenth



of the LIP funding each. Results of these projects include reduced waste quantities, more sustainable waste management and reduced transport. In Boden, northern Sweden, for example, energy has been extracted from sludge and organic waste, whereas Umeå, also in the north, has invested in a digestion tank. The town of Linköping, in southern Sweden, has a project entitled “*Cykelstaden Linköping*” (“Linköping – Cycle City”), whose aim is to reduce the number of cars on the roads and increase the number of cycleways. And in Uddevalla, western Sweden, for example, the municipality has invested in a sewerage solution to reduce emissions of eutrophying substances into lakes and streams. Projects for safe decontamination of sites contaminated with oil residues, heavy metals and other pollutants have received just over six per cent of LIP funds.

Just over six per cent has also gone on measures for local nature conservation and increased biodiversity. It is usually difficult in this area to measure and monitor environmental effects,

however. One way might be to examine the number of red-listed species within a given area, or to record the occurrence of insects, larvae or micro-organisms, which may indicate greater species diversity in the future.

Grants have also been allocated for supportive measures to help municipalities implement local investment programmes. Examples include employment of LIP coordinators and various information and public education projects

Various building projects have also received LIP grants, including the town of Malmö in southern Sweden, which received SEK 250 million for ecological conversion of the new housing area, Västra Hamnen. Some building modifications also fall under other categories, such as improved energy efficiency, and housing areas or properties that are modified to make them more environmentally compatible.

Industrial projects aimed at developing environmentally friendly processes and products have received the smallest share of LIP funding: one per cent.

Creating new jobs

The overall aim of local investment programmes is to increase the pace at which society becomes ecologically sustainable. A parallel objective is to reduce unemployment. But the most important criterion when assessing LIP applications has been the expected environmental benefits of the measures taken under the investment programmes. The number of jobs created has not played a central

role when comparing the merits of applications, although the result will nonetheless be a positive impact on unemployment: LIP is expected to create jobs equivalent to one year's work for almost 20,000 people if all measures are implemented. Most of them are temporary, however (eg, construction work), but permanent work is also being created, examples being operation of energy plants, waste sorting facilities and nature parks.

Greater cooperation

Another objective of local investment programmes is to encourage cooperation between municipalities, the public and trade and industry, and also with other actors such as universities and non-profit organisations. In the best case, this may result in the development of new forms of cooperation, create new approaches and engender environmental commitment among the public at large.

Much LIP cooperation takes place within municipal organisations themselves. Universities and colleges are involved in developing technologies and in monitoring and evaluating programmes or measures. Local trade and special interest associations and non-profit associations are mainly involved in the information and public education aspects. It is hoped that these forms of cooperation will continue even after the projects have been concluded. ■

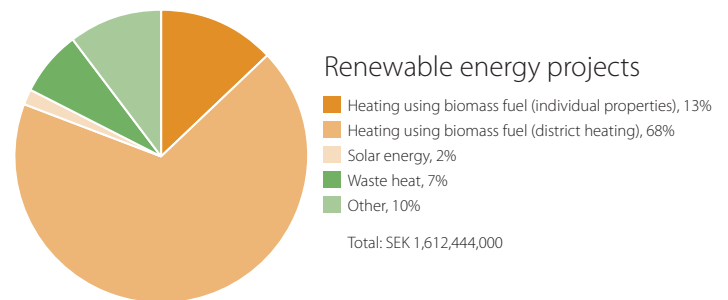
How the grants are used

SEK 1 billion has been allocated to Swedish municipalities in the process of changing over to using renewable energy sources. This is thus the commonest action taken under the LIP scheme. Sustainable traffic systems, sustainable building construction, improved waste management and decontamination of polluted sites are examples of areas which have also received funding.

Conversion to renewable energy sources

The most common type of LIP project involves conversion to renewable energy sources. Approximately one quarter (SEK 1.6 billion) of total LIP funding has been allocated to a total of 376 projects. Most of them involve expansion of district and local heating capacity. The idea of local heating is the same as district heating, but on a smaller scale, ie, local communities, villages and housing areas relying on their own facilities, primarily for biomass fuel-based heating production. In total, this category has received grants of over SEK 1 billion, which makes conversion to renewable energy sources the most important LIP area. Projects include construction of biomass fuel-based combined heating and power plants, improvement or replacement of oil-fired boilers at combined heating and power plants, or work on expanding the network of culverts so that district and local heating can replace oil and electricity.

Projects also entail measures where the individual property owner has received a grant to replace obsolescent wood-burning boilers with environmentally approved wood or pellet-fired boilers, combined with an accumulator tank. Many schools



and other public buildings have also received grants to convert their heating system from oil to pellets.

Two per cent of funding for energy conversion measures has gone on the installation of solar heating or solar cells, on bathing facilities, camping sites, sports grounds and elsewhere. Sweden's largest solar collector – 10,000 square metres – has been built at Kungälv, near Gothenburg, under the LIP scheme. And in Härnösand, central Sweden, an outdoor ice rink now serves as a solar collector in the summer, thanks to LIP.

In addition, a limited number of geothermal projects and some small-scale hydropower and wind power units have received LIP grants.

More efficient energy use

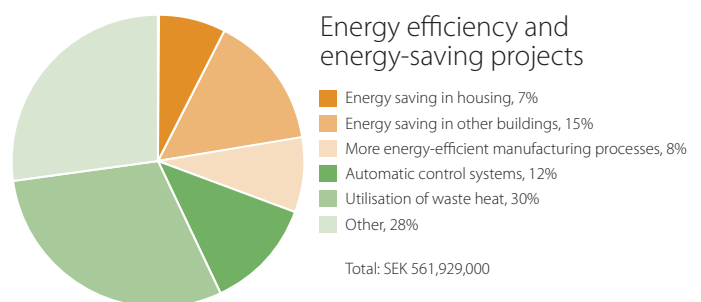
Just under one tenth of LIP grants, ie, just over SEK 560 million, has been allocated to projects aimed at improving energy efficiency or otherwise reducing energy use. A total of 201 measures are involved.

This type of project includes energy-saving measures in commercial and industrial premises as well as housing, including lighting control by

occupancy sensing, timer control of ventilation systems and changing over to low-energy light bulbs in schools, day-care centres, offices, industrial premises and hospitals. Additional insulation of buildings is another measure that has received LIP funding, as is installation of individual electricity, heating and water meters. In addition, home owners in some municipalities have been able to receive grants to improve the efficiency of their heating systems.

Measures to make use of waste heat from the pulp and paper industry, for example, have dramatically cut carbon dioxide emissions. Approximately one third of the grants awarded in this category have been allocated to measures that have often involved the construction of district heating culverts and their connection to existing or new district heating networks. In a number of cases this has resulted in synergies, since expansion of the district heating network has continued after conclusion of the investment programme. Further examples of projects are recovery of surplus cooling from heat pumps or waste heat from waste water used to cool or heat buildings and industrial plants.

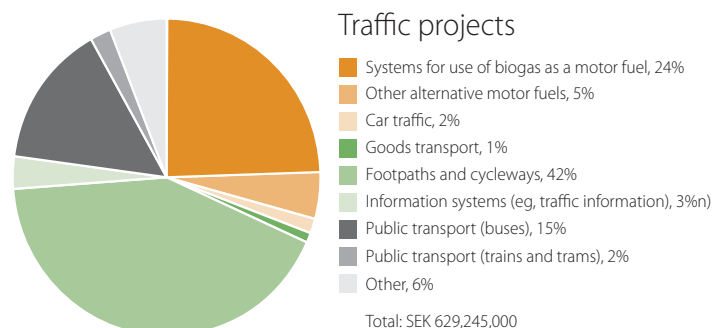
Eight per cent of funding in the category “More efficient energy use” has gone on measures intended to improve the efficiency of manufacturing processes, eg, installation of new automatic control systems. There are also many measures that will in other ways result in reduced energy use, such as changing over from standard light bulbs to low-energy LED lamps in traffic lights, as has been done in Stockholm and Kristianstad.



Sustainable traffic systems

One tenth of all LIP funds, ie, around SEK 630 million, has been allocated to various traffic measures. There are 180 projects in total.

The most common measures are to extend or improve safety on footpaths and cycleways, eg, by linking cycleways between municipalities, building crossings at different levels or safe cycle parks. Some municipalities have also converted disused railway embankments into cycleways. In addition to physical measures, there are also information campaigns and other public education projects in the form of seminars, training/education courses and fact sheets. Several municipalities are





endeavouring to reduce the number of short car journeys; cycling can be an attractive option for journeys of less than five kilometres if there are good quality and safe cycleways.

Around one fourth of traffic measures consist of establishing biogas systems for motor fuel. Environmentally speaking, biogas is preferable to fossil fuels, but the gas from digestion of waste, manure or sewage sludge must be treated before it can be used as motor fuel. LIP grants have been awarded for the building of biogas filling stations, upgrading facilities, purchase of biogas vehicles and conversion of vehicles to run on biogas. Municipal vehicles are often the first to be converted. Many municipalities, such as Linköping, also have buses that run on biogas.

Other alternative motor fuels such as ethanol and electricity have also qualified for LIP funding. Measures include constructing filling stations or purchasing vehicles. Some municipalities have also received grants to spend on persuading their own administrations, trade and industry and the public to change from fossil fuels to renewable motor fuels. Influence is exerted in the form of information campaigns, cooperation models and grants paid to companies and individuals.

Some twenty municipalities are investing in public transport by increasing accessibility for buses, modifying bus stops and improving bus timetable information, for example. Some municipalities have also received funds to set up Mobility Management centres, for IT support for car pools (usually in the form of booking systems), or other transport coordination.

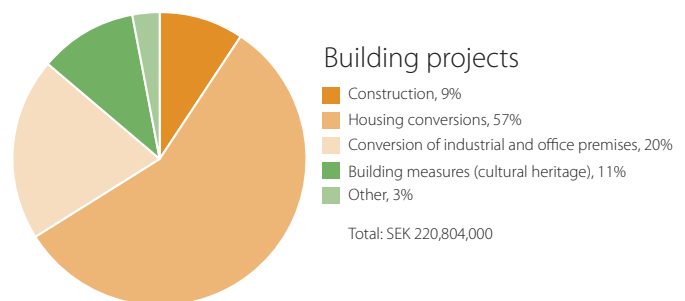
Sustainable building

Sustainable building measures received SEK 220 million in LIP grants, divided among 32 projects. Over half the grants have gone on modification of residential buildings, particularly modernisation and ecological adaptation of older buildings. One example is Kronoparken in Karlstad, a project whose main aim was to improve energy efficiency by changes to lighting and adjustment of heating systems, among other things. Other measures were intended to reduce water consumption and waste quantities.

Around one fifth of grants have gone on modification of industrial and office buildings, eg, additional insulation, renovation of windows or other means of reducing energy consumption.

Some construction projects have also received grants for efficient energy use and for reuse of old building materials, for example.

Many other building projects in receipt of funding fall under “Multi-dimensional” projects and are therefore not described under the present heading.



Better waste management

SEK 680 million was shared among 180 measures in the field of waste. More than half the grants were allocated to measures for production of biogas using small-scale systems to make use of manure and methane from individual farms for heating, and also larger systems, eg, to upgrade and treat the gas to render it suitable as motor fuel.

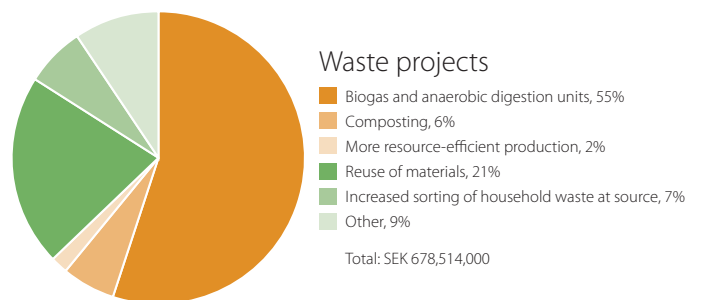
One fifth of funding in the waste field was spent on measures for recycling of materials such as bricks, slag, gravel, demolition waste, concrete and road signs. Kungälv municipality ran a project to set up a facility for reuse of road signs, for example.

One tenth of waste grants were allocated to measures to increase sorting of waste and composting projects. Other projects concern recycling of ash for use on forest or agricultural land, more resource-efficient production, reduction and disposal of hazardous waste and other industrial waste, and also reuse of building materials, for example.

Site remediation projects

A total of 24 projects received almost SEK 400 million for decontamination of polluted sites. The main aim of these projects is to restore and treat contaminated land where industrial operations have formerly been conducted. The ground is often contaminated with oil, PCBs or heavy metals. Measures to remove lead from firing ranges have also received LIP funding, and in one project an attempt is being made to compost contaminated soil so as to break down oil and organic pollutants.

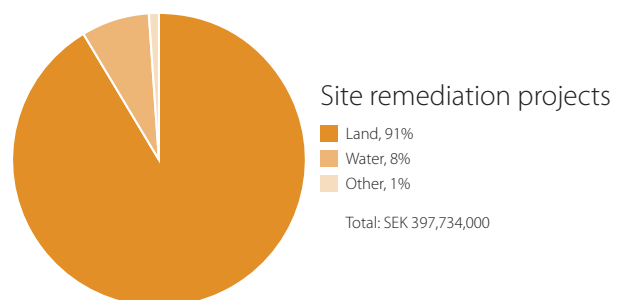
A few projects are dealing with contaminated



bottom sediment in lakes, rivers and streams. One example is Lake Turingen in Nykvarn municipality, where bottom sediment contaminated with mercury is being covered with artificial sediment to prevent dispersal of the heavy metal.

Water supply and sewerage projects

Almost SEK 600 million was allocated to measures to improve water supply and sewer systems. This represents almost ten per cent of all LIP funding. There is a total of 241 projects, roughly a quarter of which involve measures to improve private sewer systems and local water supply and sewer systems.



Mostly, funding is in the form of incentive grants for individual home owners to change over to more sustainable sewer systems. Other examples are shared local sewer systems for adjacent properties that have previously had separate sewer systems or no sewer systems at all.

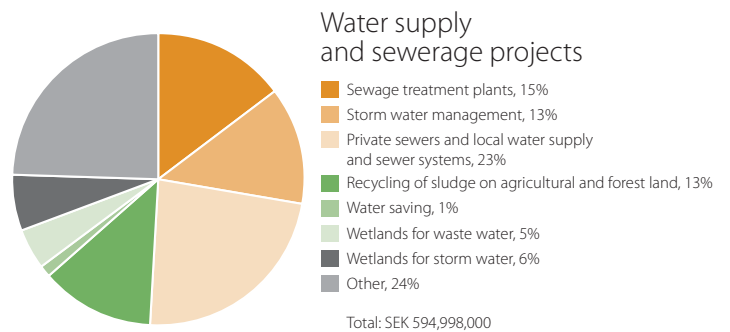
Other projects are aimed at improving the quality or manageability of sewage sludge so as to increase scope for recycling the nutrients. One option is to dry the sludge and possibly turn it into pellets.

Improved treatment processes at sewage treatment plants are other examples of projects. By creating reed beds, rhizomatous zones and wetlands it is possible to fix nutrients and reduce emissions. Both reed beds and rhizomatous zones are examples of biological filters capable of absorbing nutrients from sewage treatment plants. Wetlands are sometimes linked to sewage treatment plants to improve treatment, although storm water can also be treated in this way.

Conserving biodiversity

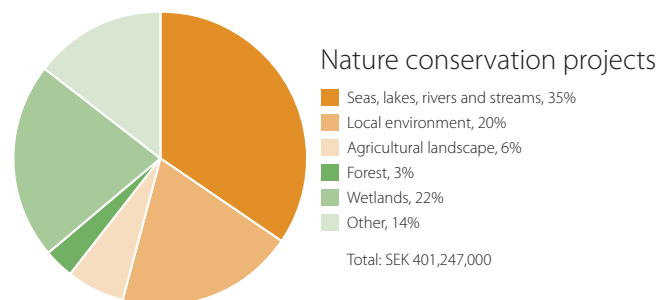
Just over six per cent of LIP grants have been awarded to nature conservation projects and projects aimed at conserving or restoring biodiversity. SEK 400 million has been shared among a total of 195 measures.

Most projects concern seas, lakes, rivers and streams, eg, construction of dams and wetlands to improve conditions for aquatic organisms and bird life. Other examples are removal of obstacles to migration of fish and other organisms in run-



ning water, or the construction of salmon ladders. Streams channelled through tunnels under roads and road embankments that have been opened for water through-flow in bays and channels also improve the prospects of rich aquatic life. Special tunnels under roads for amphibians, harvesting of reed beds, restoration of flooded areas used for harvesting fodder and regulation of water levels are other examples of measures taken.

Several projects involve changes in the local environment so that more species will flourish in the vicinity of human habitations, eg, by creating nature parks and green areas close to housing.



Overgrown wooded pastures and flooded areas used for harvesting fodder are also being restored under LIP; a number of projects involve restoration or conservation of forest areas.

Much of the action being taken in agricultural landscapes involves fencing in grazing animals, since they maintain an open landscape and are beneficial to the flora and the insect and bird fauna. Hay-making, clearance and restoration of old stone walls have similar effects.

Multi-dimensional projects in housing areas

The “Multi-dimensional project” category includes modification and “greening” of housing areas and other property and is made up of a number of different types of action. 86 projects have shared grants totalling SEK 770 million.

A common feature of this project category is restoration of certain older housing areas and incorporation of environmental considerations in construction projects, such as Västra Hamnen in Malmö and Hammarby Sjöstad in Stockholm.

The greening of housing areas involves ecologi-

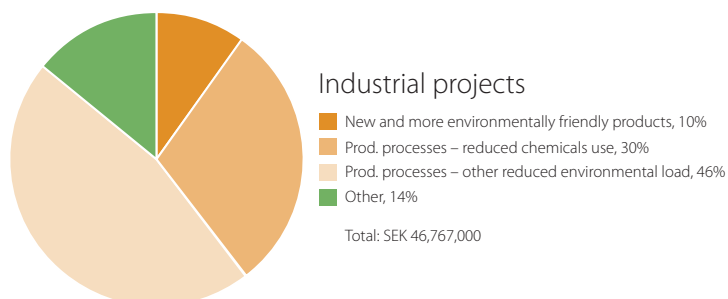
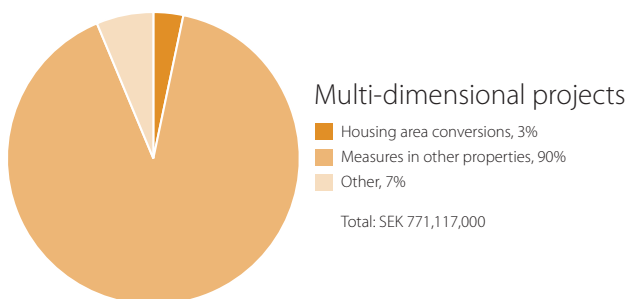
cal renovation of building facades, replacement and occupancy control of electrical fittings, automatic ventilation systems, waste sorting, local treatment of storm water and more green areas. The hope is that a better outdoor environment and greater involvement of residents will also improve the social environment in the housing area.

Environmentally friendly products and processes

A total of SEK 47 million of LIP funding has been allocated to 34 industrial projects.

The projects include measures to green existing products, or to introduce new and more environmentally friendly products. Other projects aim to improve or green various production processes, eg, by reducing emissions or use of chemicals. Examples of this are installation of bio filters to remove pollutants from emissions to air. Other measures include reuse of industrial machinery and environmental recycling of nutrients in ash from biomass fuel-based district heating production, for example.

Some projects involve recycling of waste water or closure of waste processes, which reduces or stops

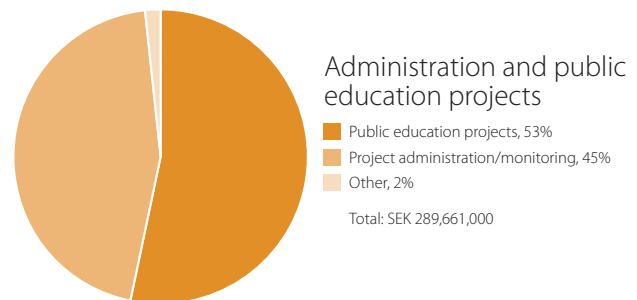


emissions of heavy metals and other pollutants. There are a number of industrial projects that have received LIP grants, but they mainly concern the energy field and do not fall under the present category.

Public information

The “Supportive measures” category received nearly SEK 300 million in LIP funding. The 257 measures cover administration of the programmes as well as information and public education projects. The methods and scope of information projects vary. Training/education courses, adult education classes and lectures are common features, particularly as regards projects dealing with building and housing, traffic and waste. General information campaigns using printed materials are also common.

Several municipalities have chosen to invest in long-distance footpaths and information centres for nature conservation and wetland projects. Information is also a common feature of energy and traffic projects, one approach being the creation of Mobility Management centres. Some municipalities



have also employed an information officer or ecologist whose task is to make personal contact with the local inhabitants, eg, as part of projects for the greening of housing areas. Several municipalities have also targeted their information on children and teenagers via local schools.

Municipalities have also been eligible for grants to coordinate local investment programmes. These grants are used mainly to pay for a LIP coordinator, responsible for liaising with the funding authority, reporting on the progress of the programme and monitoring implementation of the various measures under the programme. ■



Achieving the environmental quality objectives

The main object of LIP is to achieve environmental improvements in Swedish municipalities; there are high hopes that various measures will yield many positive environmental effects. The wide variety and large number of measures relate to virtually all areas covered by the national environmental quality objectives, which means that LIP play a central role in the efforts being made to achieve the environmental objectives.

Some effects can already be discerned in the form of lower emissions and greater conservation of natural resources. But not all measures have yet been implemented, and in some cases their

measurable effects will take time. One example is the creation of wetlands, where it takes a number of years for systems to work properly. Not all effects of LIP can be quantified; sometimes there are no methods of monitoring the effects of certain measures, which shows that development is much needed in this area.

The environmental improvements outlined in this booklet are based on the expected effects as described by municipalities in successful grant applications. It will not be possible to summarise the actual results of LIP until after 2006, when the last programmes are set to be concluded. However, experience of the programmes that have ended is that the environmental benefits are sometimes greater than those stated in the application.



Emissions from the burning of fossil fuels (including coal, oil and natural gas) add to the greenhouse effect and affect the climate. More efficient energy use and a changeover to renewable energy sources form part of a strategy intended to achieve a sustainable energy system. LIP funding allows expansion of district heating networks and investment in biomass fuel-based combined heating and power plants.

Energy

Approximately one third of LIP projects are intended to save energy, improve energy efficiency and bring about a changeover to alternative energy systems. The changes involved include saving energy in housing and other buildings, improving industrial processes, automatic control systems and utilisation of waste heat. Energy-saving measures are also included in water and sewerage projects, for example.

All in all, LIP measures may reduce Swedish energy use by 2.3 terawatt hours a year, which is more than half the output of the Barsebäck 2 nuclear reactor.

A sustainable energy supply also requires a changeover to renewable energy sources and use of energy forms providing maximum output with as little environmental impact as possible. For instance, biomass fuel-based district heating is preferable to oil or electricity for heating purposes.

If the LIP projects are implemented according to plan, 2.7 terawatt hours a year will be produced using renewable energy sources.

The main effect of changing over to renewable energy sources is that electric or oil-fired heating systems are replaced with biomass fuels via expansion of district or local heating networks. A number of LIP measures have also targeted home owners with the aim that they should change over to other forms of heating.

Total Swedish energy consumption in 2001 was **616 TWh**.

29 per cent of this was produced using renewable sources.

Emissions of carbon dioxide, nitrogen oxides and sulphur dioxide add to the greenhouse effect, affect the climate and acidify soil and water. The national environmental quality objectives lay down guidelines as to how these emissions should be reduced. Among other things, LIP make funds available for investment in renewable fuels, cleaner combustion and more efficient energy use, and are an important factor in the efforts being made to achieve the environmental quality objectives.

Emissions to air

One third of LIP projects involve measures designed to reduce carbon dioxide emissions. Reduction in carbon dioxide emissions is thus the commonest expected environmental benefit. This will primarily be achieved by reducing the use of oil, petrol and other fossil fuels. Emissions will also be controlled by changing over from oil-based to biomass fuel-based heating systems in housing and commercial/industrial premises, and by steps taken to increase the proportion of journey made on foot, by bicycle and bus at the expense of car journeys.

All in all, the measures taken are expected to reduce carbon dioxide emissions by over two million tonnes a year, provided that all planned action is taken and produces the expected effect. This represents just over three per cent of emissions in 1990.

Carbon dioxide accounts for no less than 80 per cent of Swedish greenhouse gas emissions and is thus the greenhouse gas having the greatest impact on climate change. According to the "Reduced Climate Impact" environmental quality objective, average Swedish greenhouse gas emissions should be at least four per cent lower during the period 2008 – 2012 than they were in 1990. Total Swedish carbon dioxide emissions were 55 million tonnes in 2001, which was somewhat less than in 1990.

Nitrogen oxides

Various LIP measures are expected to reduce nitrogen oxide emissions to air by more than 20,000 tonnes a year, which represents eight per cent of total

Swedish emissions in 2001. The main approach is to reduce emissions by measures such as expansion of the district heating network, transport reductions and greater energy efficiency.

Nitrogen oxides cause acidification of soil and water and lower emissions are an important step on the way to achieving the environmental quality objective of "Natural Acidification Only". Emission levels also have a significant bearing on the "Clean Air" quality objective.

One of the interim targets is that annual Swedish NOx emissions to air should be reduced by 148,000 tonnes by 2010. This may be compared with emissions of 251,000 tonnes in 2001.

Sulphur dioxide

Sulphur dioxide is another gas adding to acidification of soil and water. It is mainly formed from the burning of sulphurous fuels; an effective way of reducing concentrations is to take various energy measures, such as improvement of energy efficiency and use of district heating facilities. Concentrations can also be limited by cutting down road transport.

In total, Swedish sulphur dioxide emissions to air are expected to fall by over 2,000 tonnes per year thanks to local investment programmes. This represents approximately three per cent of total discharges in 2001. Lower concentrations of sulphur dioxide are a key component of the efforts to achieve the "Clean Air" and "Natural Acidification Only" environmental quality objectives.

Our waste mountains continue to grow, although the things we throw away can often be used in a better way. Local investment programmes enable some waste to be put to use, eg, in the form of compost and biogas production.

Reducing waste quantities

Thanks to LIP measures, less household waste, sludge and other waste is ending up at rubbish dumps. If all measures are implemented, it is estimated that a reduction of over half a million tonnes a year will be achieved. Instead of going to the tip, waste is to be used as a resource for biogas production, recycling, reuse and compost, for example. This is a good way of saving raw materials as well as energy.

The trend in society is for waste quantities to

increase and waste sites to be filled with rubbish that can often be put to better use. The Swedish Government has introduced tougher legislation to halt this trend; it has been illegal to landfill sorted and burnable waste since 2002. In 2005 it will also become illegal to landfill organic waste (compost).

Consumer waste totalled about 6.2 million tonnes in 1994. Some 2.4 million tonnes of this was landfilled.

Photo: Kjell-Arne Larsson





Car traffic should be reduced. Many municipalities are of this view and propose more footpaths and cycleways in their LIP applications.

Transport changes

Local investment programmes will reduce and to some extent change the nature of road transport. If all measures are implemented according to plan, traffic is expected to decrease by a total of 86,600,000 vehicle/kilometres a year. This is equivalent to 113 return trips to the moon.

Limiting the number of kilometres travelled has many positive environmental effects, including reduced use of fossil fuels (and hence lower emissions causing acidification and global warming), lower exhaust levels (which is good for health and the environment), and less noise. Less traffic also results in a more pleasant environment and more attractive city centres.

The commonest LIP measure in the traffic sector is to build footpaths and cycleways. If more people leave their cars at home and start cycling, there will not only be positive environmental effects; our health will also benefit and we may also change our behaviour and become more environmentally friendly in other areas as well. Better public transport and car pools are other means of reducing car traffic. Yet another way is to use locally produced biomass fuels for heating, instead of oil that has been transported from other parts of the world.



Various measures in the water and sewerage sector are needed to reduce eutrophying emissions of nitrogen and phosphorus. Local investment programmes are expected to reduce phosphorus emissions by 194 tonnes a year and nitrogen emissions by over 3,200 tonnes a year.

Lower emissions of nitrogen and phosphorus

Nitrogen saturation of soil and eutrophication of water cause lakes and watercourses to become overgrown and to suffer from oxygen deficiency, which in turn leads to deteriorating water quality and loss of species. Emissions of nitrogen and phosphorus to water must diminish if the environmental quality objectives are to be achieved.

LIP measures include improvement of sewage treatment plants and treatment processes. Another way of reducing emissions is to establish wetlands, which serve as a natural form of sewage treatment by absorbing nutrients.

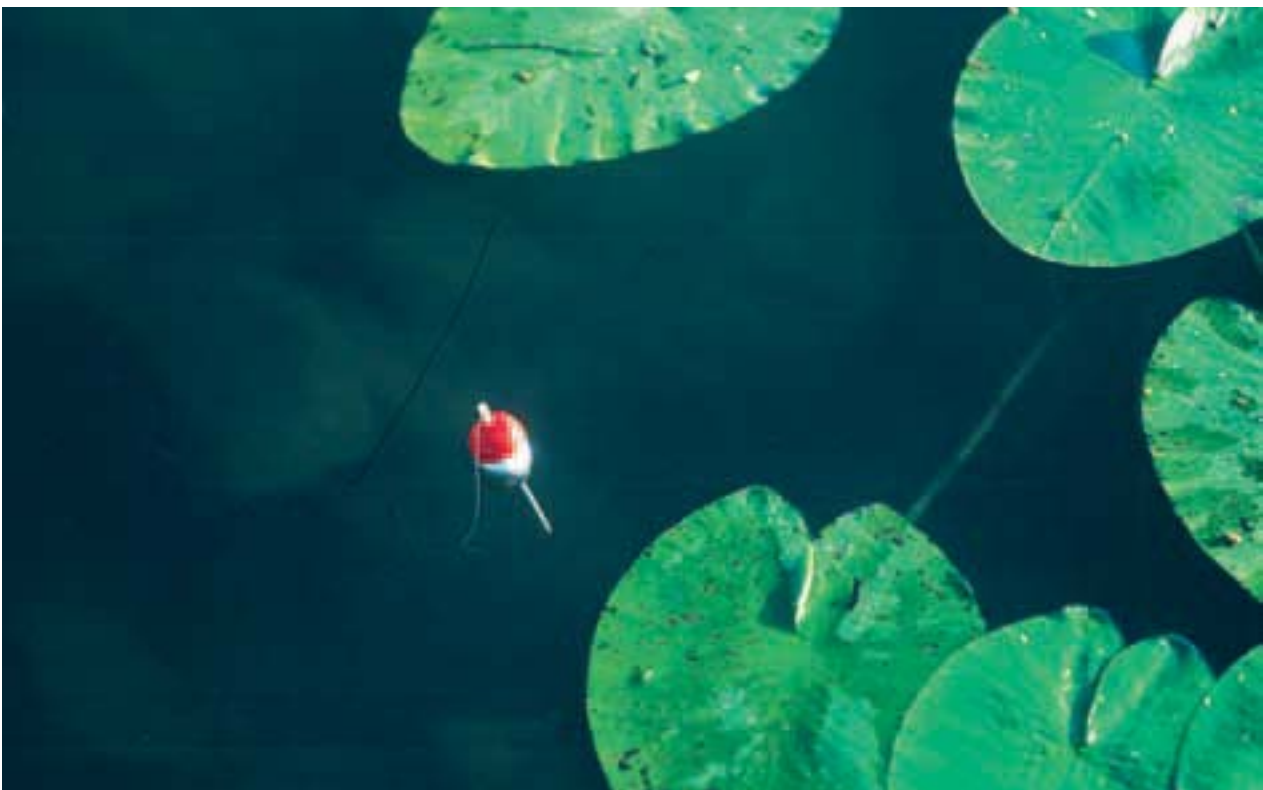


Photo: Tero Niemi

Most people need to have access to the countryside to remain happy and healthy. Even though this need is well documented, both nature and biodiversity are under threat throughout the world. Many LIP measures are aimed at improving living conditions for animals and plants, particularly in the local environment and in urban areas.

Nature conservation and biodiversity

Modern society demands increasing areas of land for housing, industry and infrastructure. Plant and animal habitats and our recreational use of the countryside are affected by increasing emissions, noise, barrier effects and other factors.

Improvement of animal and plant habitats, particularly in the local environment and urban areas, will require various nature conservation measures. Sometimes it may suffice to create a

small protective zone around a pond in order for frogs to thrive; whereas fish in a free-flowing stream may need stretches of several kilometres without any barriers to migration if they are to survive.

LIP measures including nature conservation to preserve or restore species diversity in different biotopes are highly relevant to achievement of the environmental quality objectives.



Photo: Tero Niemi

Most LIP measures have several environmental benefits, of which one or two often predominate. But some measures may also produce a large number of positive effects on the environment. The most obvious example is that of facilities for the production of biogas and systems for using biogas as a motor fuel.

Biogas – many environmental benefits

Biogas is a sustainable fuel, which is largely capable of replacing fossil fuels. It consists of methane and is made by anaerobic digestion of sludge from sewage treatment plants, manure and other organic waste from households, agriculture and the food industry.

Emissions of carbon dioxide and oxides of nitrogen and sulphur are reduced by replacing

fossil fuels with biogas, and the waste from which biogas is made can be put to use instead of ending up on a rubbish tip or being incinerated. Biogas production residues are composted and can be used for soil improvement. Thanks to LIP, several municipalities have been able to invest in biogas production, biogas buses and other vehicles that run on biogas.

The environmental effects described so far are the most common and those that are expected to have a fairly major impact, but there are more. The large number of LIP measures in themselves result in many environmental benefits, eg, safe disposal of heavy metals, PCBs and oil residues.

Further environmental benefits

Other action includes dealing with asbestos as part of various decontamination projects, and improved disposal of storm water, which may allow hazardous substances to be collected instead of being dispersed in the environment. Lower emissions of VOCs, particulates and hazardous emissions from older wood-burning boilers are other positive environmental effects.

Another expected environmental benefit is conservation of natural resources, for example, by reduced use of natural gravel, greater reuse of products and recovery of various materials such

as plastics, wood and metals. Recycling of plant nutrients from ash, compost or anaerobic digestion residues for use on forest or arable land are other resource-saving effects of some LIP measures. Some of the projects being carried out will probably also reduce the use of chemicals and ozone-depleting substances, which is a good thing.

Quantities are not always great in international terms, although they may nevertheless be important at local level. Every effort made to conserve resources and reduce the load on the environment is an important step on the way to a sustainable society.

There is no requirement that public education or information should form part of LIP projects, but it has been possible to apply for grants for information campaigns targeted on the public. Many municipalities have realised the importance not only of raising awareness, but also of influencing and involving citizens in various LIP measures.

Information and public education

By informing people about specific environmental projects, it is possible to reveal opportunities and illustrate cause and effect, which will hopefully improve understanding and acceptance of the new technology and the changes resulting from the investment programmes. Better knowledge can also make it easier for people to make environmentally friendly choices and change their lifestyle to render it compatible with sustainable development.

It is difficult to measure the effects of various public education projects, since it is a question of influencing human behaviour, which will in turn have an impact on the environment. Nonetheless, information and public education are probably key elements in the implementation of many projects. Most municipalities that have carried out public education and information campaigns indicate in their final reports that results have been good. ■



Photo: Jörgen Pålsson, Norrlandia

The Swedish Environmental Protection Agency – Investment Programmes Section administers government funding for local investment programmes (LIP) and climate investment programmes (Klimp). The section receives and processes grant applications and monitors and evaluates the programmes. We prepare grant decisions to be taken by the Investment Support Council and arrange for final payment of grants. We are also responsible for information about the system of regulations and the application procedure, and produce information on the results and outcome of completed investment programmes.

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The local investment programme scheme is Sweden's largest single environmental investment to date. SEK 6.2 billion was allocated to over 1800 environmental projects in 161 municipalities between 1998 and 2002. Many of the projects are well under way; some are in the starting blocks; others have now been completed. This booklet outlines the uses to which the investment grants have been put and the results expected to be achieved.

Local Investment Programmes

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