Impressive results from the Dutch Economic Subsidy Programme concerning innovation and energy

RESULTS OF DUTCH GOVERNMENT POLICY

In recent years, Dutch subsidy policy has been targeted intensively at the theme of innovation and energy via its subsidiary, 'Agentschap NL'. In 2010, the policy was converted into a 'green deal' approach, with the government becoming more indirectly involved. The integration of the themes of energy and innovation has however very much remained the goal of the approach. Subsidies were previously allocated primarily through a "tender set-up", using a weighted evaluation system; a kind of innovation contest. In 2005/2006, Bronswerk Heat Transfer reached two top places in this system with its RADIAX®-compact pumps, compressors and turbines and the Whizz- Wheel® industrial fan projects. Both are innovation-intensive novelties for two energy usage fields which account for around fifty per cent of all electricity worldwide. The potential energy savings for both projects could make a very significant contribution to worldwide CO2 reductions, but will certainly enable an extensive range of equipment relating to heating, cooling and industrial process improvements to function more effectively.

The new fans that were developed with the support of the subsidies consume fifty per cent less energy and are also 6dBA quieter; they are applicable in a wide range of markets. The RADIAX® ultra compact compressor can achieve savings of seventy to eighty per cent in heat recovery processes.

From idea to real life energy innovation, A-frame condenser with Whizz-wheel fans

MARKETS AND MARKET PENETRATION PHILOSOPHY

The target markets for the two energy-saving products and technologies are oil/ gas, refrigeration technology, air conditioning, computers (and data centres and servers in particular), domestic appliances, car cooling systems and ventilation, electric motors, and boiler superchargers. Equipment in these markets often needs to last for decades, which is why the markets are often hesitant when it comes to highly innovative technologies: they have to be reliable, long-lasting, and capable of integration with existing equipment.In the last five years, however, companies have been increasingly active in adopting new technology that saves energy while respecting the environment, all based on a sustainability philosophy. Another important reason for their doing so is the growing realisation that selectively implementing energy-saving equipment can help deliver a better process economy. For example, an ever-greater number of companies aim to see the costs of their investment repaid within around five years, which amounts to a return on investment of about 20%. The major energy companies seek

to achieve repayment within ten years (which is still a return of 10%). The support of the government /'Agentschap NL', through energy and environment convenants, creates a stronger platform for the introduction of breakthrough innovations – pioneering technologies that can bring about significant changes in organisations, and for which a strong entrepreneurial and investment-minded company attitude is required.

The business-outlook has become more favourable thanks to this change of policy, but the current uncertain financial climate is markedly making it more difficult to secure financing for projects. However, in many markets there are companies with very healthy cash flows, which are not particularly dependent on banks or their government. Offering customers convincing financial and technological benefits means it is easier for them to make decisions based on sustainability. Even the most conservative markets are now coming round to this well-founded philosophy.

FAN TECHNOLOGY

More than two years after the market introduction of the new fans, there has been a worldwide response and intensive interest from the very markets and geographical areas that were not directly approached. The basis for this interest appears to be the outstanding performance of the systems in practice, about which information has now found its way onto the internet. There is no stopping the worldwide flow of information on the almost unbelievable performance: a 50 % reduction in energy consumption, noise levels that are 6 dBA lower than the quietest existing fans, in addition to which the fans are much more compact, lighter, and produce a 50% smaller carbon footprint. There already are a significant number of licensing partnerships that account for a major proportion of the markets in which the new fans could be used. The licensing partners can see the real prospect of 'game-changing' fan technology. Huge amounts of energy can be saved every year, and much more quickly than previously envisaged.

HYBRID FLOW MACHINES

Processes for which pumps, compressors and turbines are used almost by definition involve highly complex systems for handling a wide range of liquids, gases and multiphase mixtures. Safety is a predominant factor here, given the high pressures combined with high temperatures and chemical compatibility. The variety of machines is great. The novel hybrid flow machines have similar energy saving potential as the new fans, and worldwide interest has been correspondingly high; the addition of new thermodynamic features means even more savings. One particularly outstanding feature is the reduced space they occupy – about ten times less than conventional machines, thanks to the complete integration of the electric motor with the flow machine. This removes the need for engine rooms and thereby drastically reduces total installation costs. In addition, unique flow features allow new thermodynamic processes of wet compression and expansion, that can cut energy consumption still further. The market introduction of complicated processes and machines is a more gradual one than is the case with fans used for handling air. Company practices will be turned on their head, given that the process of understanding and accepting the new energy and mechanical 'laws' of the hybrid flow machines will require a high level of knowledge exchange. The first high-capacity applications are now found in an unexpected quarter: in the 'large' foodstuffs industry, where sustainability is already well established. The potential energy savings for these applications could be as much as around seventy or eighty per cent.

SUBSIDY EFFECTIVENESS AND ECONOMIC SIGNIFICANCE

For successful projects, the return on investment for the government is exceptional, both directly and indirectly, and easily makes up for the flops that inevitably occur. Projects would certainly be more effective if there were a less complex system of subsidies, such as a simple taxation measure rather than series of committees and mountains of paperwork. This would make it easier to 'measure' the economic benefits – perhaps it is time to revive the Dutch W.I.R law (Investment Account Act).