



# RETURN

WINTER 2005

RECYCLING NEWS FROM TOMRA



## MAKING RECYCLING MORE REWARDING

TRC project launches new incentive program

**RECOND AIR**  
A fresh approach to reverse vending

**FULL SPEED AHEAD**  
Tomra Production in high gear

**REFUSE-DERIVED FUEL**  
TiTech sorts it out

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TRC project launches new incentive program



Since joining TOMRA a little more than half a year ago, I have become more and more convinced that there is a bright future ahead of us. I believe the demand for more efficient recycling systems will increase significantly in the coming years, and that our unique expertise within this industry will provide many opportunities to grow our business.

I also believe, after having completed a process of realigning our operative structure and priorities during the past several months, that we are now in a better position to capitalize on future opportunities. Our task now is to move full speed ahead in putting TOMRA back on a solid growth curve. To do so we need to go after the best opportunities, those that will lead to growth which is both sustainable and profitable.

In the near term, executing on the opportunities offered by the development of the non-refillable deposit system in Germany will play a significant role in our growth strategy. Our preparations toward this market are beginning to materialize into measurable financial results after several years of large investments and uncertainty with regard to the system framework. With this uncertainty now behind us, we stand ready with an excellent portfolio of options to meet the needs of our customers. We feel strongly we have the best solutions available in terms of a price/performance ratio and are confident we can achieve our goal of being the preferred supplier in this market. If this translates to attaining a market share of between 50 to 70 percent, we will be very satisfied.

Beyond our efforts to maximize the current opportunities in Germany, we are pursuing a number of promising initiatives for our future growth. In this perspective, our ability to develop non-deposit solutions is vital. Projects in the UK, Japan and the US together with minor projects in other countries are key to that future growth. One of these projects is our collaboration with Tesco in providing a new recycling center concept in the UK. The feedback from Tesco and consumers is positive, and we are enthusiastic about the future potential of this project.

Our recycling technology business segment is also showing good results. TiTech's development of a high resolution NIR scanning system offers unique capabilities for the sorting of waste, and is helping to deliver solid growth for the company within waste-to-energy applications. More details about this growing business area are provided in a separate article in this issue.

Our overall agenda going forward: sustainable profitable growth. How are we going to get there? First and foremost by maintaining extreme attention to satisfying the needs of our customers. This will encourage greater sales, which in turn will allow us to attract and hire new employees to satisfy a growing customer base. Second, by maintaining a lean, flexible operating structure that is motivated toward increasing our profitability. Third, by intensifying our ability to provide the right products in the right markets at the right time.

We are going to get there. We are going to make TOMRA a growth company-for the benefit of our customers, our employees, our shareholders, and last but certainly not least, our environment.

*Merry Christmas and a Happy New Year!*

Amund Skarholt, *President & CEO*

## RETURN | WINTER 2005

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*“Our task now is to move full speed ahead in putting TOMRA back on a solid growth curve”*



AFTER UPGRADE



BEFORE UPGRADE

# Yes!

- **Lower operating costs**
- **A more attractive and hygienic return area**
- **Minimal service interruptions**
- **More satisfied shoppers**
- **Happier store personnel**
- **Increased store revenues**

*These are the benefits supermarkets are experiencing that have said yes to installing a top-notch return facility featuring TOMRA's latest RVMs and backroom systems.*

Think about it. As a consumer, where would you prefer to go when you are ready to return a week's worth of empty beverage containers: to a store that has an inconvenient facility with outdated return machines, or to a store that has the best machines and a clean, convenient return area? For most people the choice is clear. And for stores which have recognized the importance of upgrading their return facilities, the impact has also been clear.

“ *We are incredibly satisfied with the result of our investment in a new TOMRA return system. Just on personnel and storage costs alone we've achieved savings of at least SEK 54,000 per year compared to our old system. On top of that we see an increase in the number of returned containers indicating an increase in customer visits.* ”

*Peter Eriksson  
Store Manager, ICA West Supermarket  
Uppsala, Sweden*



# Making your return facility an attractive “Welcome Center” for your customers

- Opportunity for consumers to wash and dry hands
- Modern TOMRA reverse vending equipment
- Receptacles for trash, plastic bags or other recyclable items
- A clean and tidy return area



## TOMRA Recond

*TOMRA's professional cleaning program significantly improves operating performance and the overall return experience*

Although TOMRA has designed its reverse vending components to tolerate a high level of dirt and remaining liquids from the used containers that they handle, stores can achieve very beneficial results by implementing a regular cleaning and maintenance program.

A proactive maintenance program helps stores to not only better protect their reverse vending investment, but also to encourage greater customer loyalty by ensuring that shoppers will be met with a clean and well-functioning return facility. And while regular cleaning by store personnel is very important, stores seldom have the expertise to do the type of detailed cleaning which TOMRA service personnel can provide.

In Europe, TOMRA's professional cleaning services are packaged under the name TOMRA Recond. Numerous customers are taking advantage of this program and achieving impressive results.

Says Frank Lippert, Sales Director of Tomra Systems Norway:

*"Our customers are seeing significant increases in operating performance after implementing Recond. For example, one of our customers in the Oslo area was experiencing 30 machine stops per week with about 350 returned containers between each stop before it started the Recond program. After the first Recond cleaning, the store immediately dropped to 2 stops per week with 5,000 returned containers between stops--something which I think qualifies as a dramatic improvement!"*



### TOMRA Recond includes:

- Thorough cleaning on the inside and outside of the RVM and all related backroom equipment, using environmentally friendly methods and materials.
- Cleaning of the entire area surrounding the reverse vending installation.
- Complete machine performance test and changing of any necessary parts.

### THE NOSE KNOWS

European consumer surveys\* show that up to 82% of shoppers think that the cleanliness of the return area is very important. The perception of what is clean is not only dependant on how the area looks, but also very much on how it smells.



### THE SOLUTION

## Recond Air



\* TNS surveys in Norway, Finland and Holland; GfK survey in Germany; 2003-05

# Recond *air*

## A fresh approach to reverse vending

Consumers seldom rinse their containers before bringing them back to a store to receive their deposit refund. This leftover liquid, typically beer and soft drinks, can spill out of the containers and produce unpleasant odors and working conditions in the backroom area.

Even with regular cleaning, the odors from remaining liquids in returned containers can often seep from the backroom into the sales area and create an unattractive return experience for consumers.

TOMRA now provides an innovative solution as part of the Recond cleaning program: Recond Air. Utilizing a unique patented ionization process developed in cooperation with leading institutes specializing in this field, Recond Air neutralizes odors without the use of chemicals or UV rays.



“The difference between the old solution and our new one is like night and day. The convenience of our new RVM and backroom system has improved the whole operation tremendously. We also installed the Recond Air unit at the same time we replaced our old equipment, and we have noticed a big difference in the quality of the air from day one. Before, the smell in the backroom was at times pretty bad, and could often be noticed in the store area as well. This problem has completely vanished since we installed this equipment.”

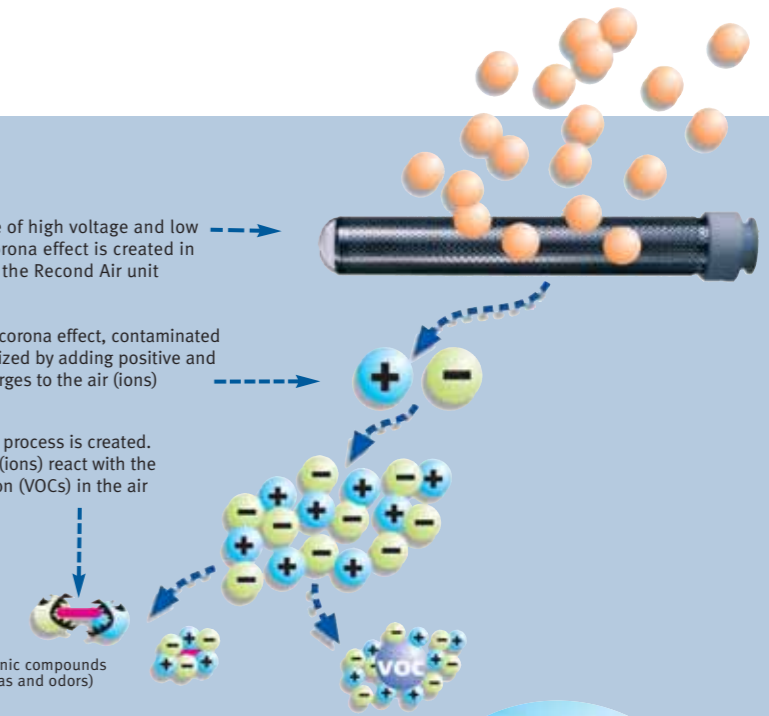
Terje Buflod  
Store Manager, Meny Supermarket  
Snarøya, Norway

### Here's how it works:

- 1) With the use of high voltage and low current, a corona effect is created in the tubes of the Recond Air unit
- 2) Through the corona effect, contaminated air is neutralized by adding positive and negative charges to the air (ions)
- 3) An oxidation process is created. The charges (ions) react with the contamination (VOCs) in the air
- 4) The contamination is turned into CO<sub>2</sub> and water



VOC= Volatile organic compounds  
(airborne germs, gas and odors)



The Recond Air cleaner is the only system that continuously monitors the quality of the air and automatically regulates the ionization process accordingly.



# Putting it all together



## TOMRA's production system shifts into high gear

*TOMRA is now in the process of rapidly ramping up its production system in order to deliver on several large orders received this autumn. By March TOMRA's production capacity will be running at about 1,000 RVMs per month, which is approximately three times higher than the company's average monthly production level.*

Return visited the Tomra Production facility in Lier recently to take a peek at how things are going and to have a chat with the company's managing director, Geir Hanevold.

*Return: So tell me Geir, the place looks quite a bit different since the last time I visited a few weeks ago. What have you and your colleagues been up to lately?*

*Hanevold: Right now we're moving full speed ahead in preparing the assembly area for the new machines TOMRA is producing for the German market. A couple of weeks ago this area was used as a warehouse which was filled with shelves 10 meters high (see insert photos p. 10). Many of the parts that were stored here belonged to machines no longer in production, so we salvaged what we could use again and decommissioned the rest to make way for progress.*

continues →

### TOMRA PRODUCTION

- Administers TOMRA's order system and has responsibility for final assembly and quality assurance of the majority of TOMRA's reverse vending machines.
- Currently has 77 full-time employees and 10 contract workers.
- Utilizes a 9,500 square meter production facility located in Lier, Norway (about 15 minutes from TOMRA's Asker headquarters).

8 DECEMBER 2005:  
TOMRA PRODUCTION FACILITY, LIER, NORWAY.  
Production of TOMRA's reverse vending machines is in full swing.  
(Above) Pictured here is the assembly area for the heart of the RVM, the recognition unit.  
(Right) An area previously used for storage now is being made ready as an assembly line for mounting the upper recognition units to the bottom collection cabinets.



### TOMRA's SUPPLIER-BASED PRODUCTION STRATEGY

#### Low to medium volume, high flexibility

Lars Høglund (SWE)  
HSM (GER)  
Moss jern/Stanse (NOR)  
Kitron (NOR)  
Hapro (NOR)  
Propartner (NOR)  
Metrologic (USA)  
Swecoin (SWE)

Th. Kristiansen  
Norway

Tomra Production AS  
Norway

Subsidiary,  
Distributor  
or  
End  
Customer

#### High volume, low cost

PartnerTech (POL)  
ZAP (POL)  
Orion (SWE)

PartnerTech  
Poland/Sweden

SUB-SUPPLIERS

ASSEMBLY

DISTRIBUTION

INSTALLATION



Putting it all together, continued

**Return:** Speaking of progress, are there any other new developments in TOMRA's production process?

**Hanevold:** Oh yes, we are constantly looking for and implementing improvements wherever we can. This includes every aspect of our operations, everything from the packaging we use, our administrative processes, supply chain logistics--you name it. For instance, over 80 percent of all the thousands of parts that come in from our suppliers are bar-coded so that we can quickly scan them into our tracking system using mobile terminals which are connected to our wireless internal data network. This has eliminated a great deal of unnecessary paperwork and translated into a cost savings equal to about one full-time employee.

**Return:** It must be quite a challenge to operate a cost-effective production system that is subject to such large swings in demand. What would you identify as the most important ingredient in successfully meeting this challenge?

**Hanevold:** Flexibility. About 80 percent of all our reverse vending machines are produced according to customer specification. Nevertheless we guarantee that machines will be shipped within a maximum of 15 days--regardless of volume. This places a huge requirement on flexibility, not only within our own processes, but from our suppliers as well. We operate according to the "just-in-time" and "ship-to-line" principles, where all parts arrive as they are needed in the production of specific orders. So having a highly integrated, flexible and well-orchestrated supply system is extremely important to us!



production partners



- PartnerTech is a leading international contract manufacturing company with headquarters in Sweden and production facilities in USA, Finland, Sweden and Poland. The company employs approximately 1,300 people.
- PartnerTech is one of TOMRA's new strategic production partners, adding high volume/low cost capabilities to the TOMRA supply chain. PartnerTech's production of TOMRA RVMs will occur principally at its plant in Sieradz, Poland.
- PartnerTech's 6,000 square meter, state-of-the-art plant in Sieradz was officially opened on 22 September 2005.



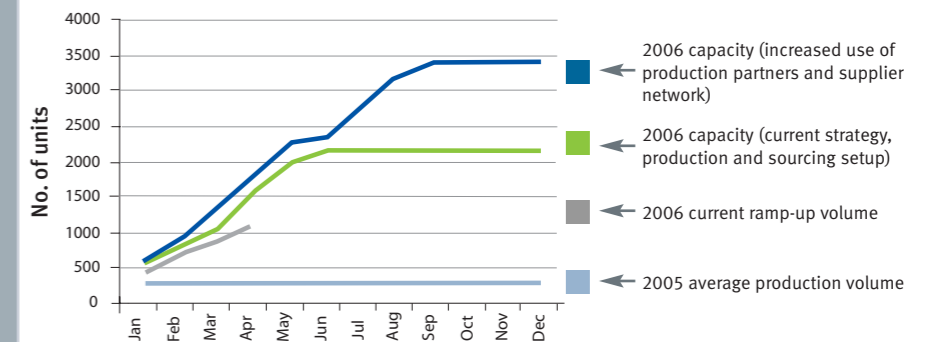
- Established in 1944, Th. Kristiansen has been one of TOMRA's most important production partners for over 20 years.
- The company, which utilizes a 12,500 square meter facility in the city of Moss about 60 km from Oslo, employs 135 people working within the areas of development, component production and assembly.



- Delivers about 1,500 individual components and assembled modules to TOMRA's production facility in Lier every weekday.



TOMRA's monthly production capacity scenarios, 2006



# TURNING WASTE



into energy

## The challenges

- Less and less landfill space.
- More and more garbage.
- Increasing waste disposal costs.

## The solutions

REDUCE  
unnecessary waste

REUSE

RECYCLE

RECOVER

DISPOSE

# REFUSE-DERIVED FUEL

## TiTech sorts it out



Municipal waste on its way to being automatically identified and sorted.



The waste material passes under the TiTech High Resolution Scanner at a rate of between one to ten tons per hour.

Refuse-derived fuel (RDF) is a term that applies to materials with a high calorific value (i.e. able to release a high percentage of calories when burned) removed from municipal solid waste streams and used as fuel for example at cement factories and power stations.

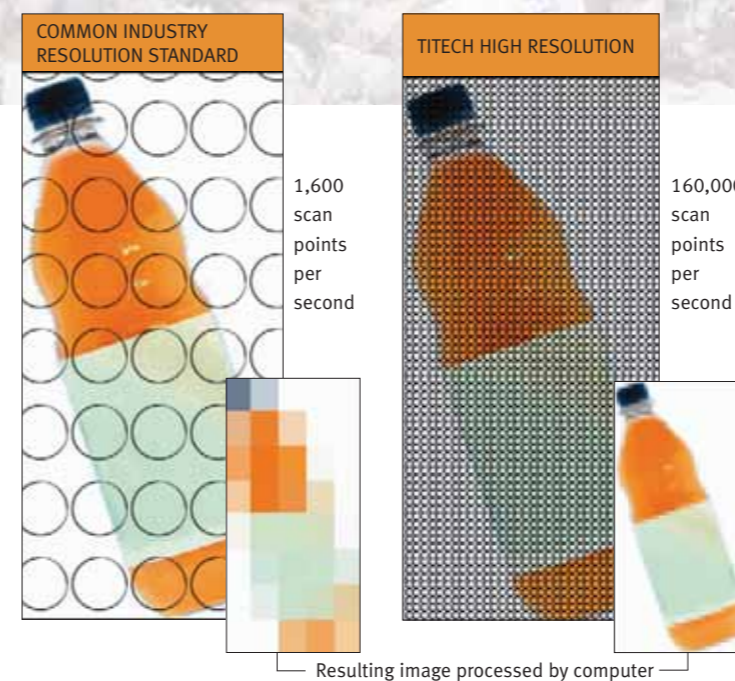
RDF production is a rapidly growing waste management solution, particularly in Europe and Japan, where available landfill space is declining. With rising landfill costs, waste management operators are finding it increasingly attractive to invest in technology that can sort out and process RDF-suitable materials that would otherwise be sent to landfill at a high price. This provides several benefits to society: 1) reduced waste going to landfill; 2) municipalities reduce their waste

management costs; 3) users of the fuel receive a fee for using the fuel, which makes it cheaper than conventional fuels like coal, oil or gas; 3) strict emission standards make RDF as good or better in terms of air quality relative to conventional fuels; and 4) by making use of the inherent energy in RDF, an additional environmental dividend is achieved by avoiding the use of conventional fuels.

The increased use of RDF is creating a rapidly growing market for TiTech. TiTech's sales related to RDF production have increased from about 10 percent of their total systems sold in 2004 to 25 percent this year. About 50 percent of all TiTech's sales in Germany this year have been to the RDF segment.



- TiTech is one of the world's leading providers of automated waste sorting equipment, with 800 sorting units in 15 countries sorting over 20 billion items a year.
- TiTech technology provides a highly reliable and cost-effective way to identify and segregate waste materials for recycling or energy recovery applications.
- Headquartered in Oslo, Norway. Subsidiaries in Germany and Spain, distributors in six other countries.
- Founded in 1993, entered the Tomra Group in 2004.



### THE TITECH HIGH RESOLUTION SCANNER

One of the most important criteria in producing high quality RDF is being able to deliver a sorted product that has a chlorine content of less than 0.5 percent. This means being able to reliably identify and sort out all PVC plastic from the mix.

TiTech's high resolution scanning system offers the highest performance available for sorting out PVC and other material types, carrying out millions of measurements per second.

# Making recycling more rewarding

## THE TOMRA RECYCLING CENTER

- The Tomra Recycling Center being piloted in the UK is the first of its kind in the world, utilizing a number of unique patented technologies.
- The pilot, which includes six TRCs, is scheduled to run through the first quarter of 2006.
- The first TRC was installed in November 2004, the most recent opened on 9 December, 2005.
- The machines take all rigid plastic products (bottles, ready meal containers, yogurt pots, margarine tubs, etc.), aluminum and tin cans, glass bottles and jars of any color. Paper, cardboard and plastic bags can also be dropped off at a separate point at the TRC.

Now there's a new incentive to recycle at TOMRA's automated recycling centers being piloted in the UK: the Recycle and Reward program.

The Recycle and Reward program has been implemented to encourage more people to recycle their used household packaging using the Tomra Recycling Center (TRC). Every six items returned at the TRC gives the recycler a chance to either win an iPod Shuffle, receive pure discount vouchers for Stella Artois or Coca-Cola products, or send a donation to the Naomi House Hospice in Winchester.

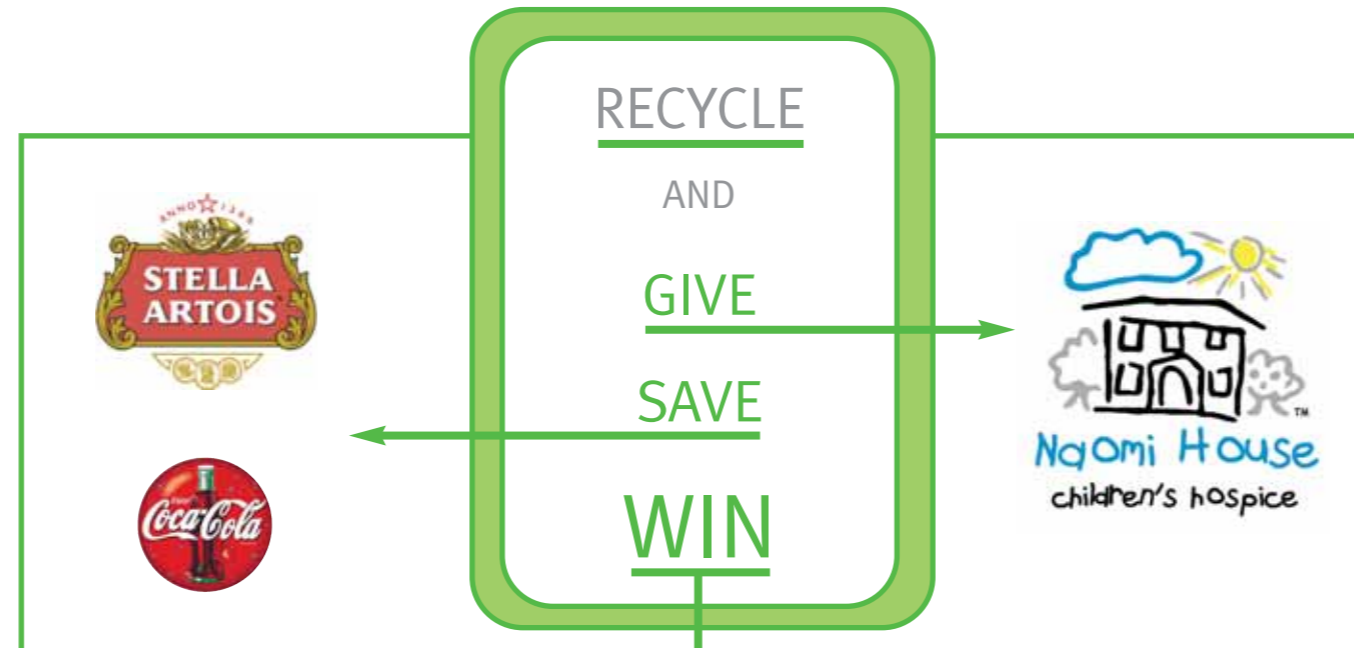
By bringing more of their waste materials to the TRC, consumers are helping to make the recycling process more convenient, efficient

and environmentally friendly. Compared to the bottle banks which were used previously at the pilot locations, the TRC takes all acceptable materials in one central opening and automatically sorts them to their proper collection bin. Before going into the bins the pure material fractions are compacted to a minimum (PET, HDPE bottles and metal cans are granulated down to 1/15th of their original volume). This means one truck can transport the same amount of materials that required 12 trucks with the bottle bank system.

The Recycle and Reward program has been developed by Tesco in collaboration with TOMRA, and is being partially funded by the Recycle Now campaign created by the Waste & Resources Action Programme (WRAP). WRAP is a major UK program established by government to promote efficient and sustainable systems for recycling and waste minimization.



Chris Packham, presenter of the BBC TV program "Inside Out," and students of the local Tannersbrook Junior School were the first recyclers to use the new TRC at the Tesco store in Millbrook, Southampton when it was officially opened on 18 October 2005.



[www.recycleandreward.co.uk](http://www.recycleandreward.co.uk)