



WAY of life



edition

41

May 2017





smart industry

The entire world is focusing on so-called smart industry, industry 4.0 or the internet of things. There's no point going over this again, as google and youtube tell the whole story.. Many conferences, seminars, trade fairs, trade journals, presentations, lectures, newspapers and industry associations cover this subject in great depth. So naturally it was a hot topic during the tbp customer & supplier days. The theme was "no time to waste" for a very good reason.

There are even people who view that smart industry as mere hype... but nothing could be further from the truth! And it won't have eluded you that to get to the heart of smart industry you need software, a lot of software, in fact a huge amount of software! Investments in software at tbp currently exceed that in equipment

But one major question remains unanswered: where is this 'smart' software?

As long as you require 6 IT workers, have to pay around € 250,000 in software maintenance per year and the joint connections don't yet work or don't yet work properly, then there is a great deal of work still to be done. We currently have over 40 software packages to design automation and we're still not there yet. Given the size of tbp, this has a major effect on the final cost price, which is a barrier we must break through. So economy of scale is a primary requirement (for this read: orders) in order to arrive at a smart industry-compliant pricing structure. Finally, all of this attention and expertise, discussions, investments and connections must result in lower costs. Total Cost of Ownership is the magic word for now in smart industry!

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The South Holland regional award for smart manufacturing goes to tbp

Metaalunie Smart Manufacturing Award regional winner

At the end of last year, tbp electronics won the Smart Manufacturing Award for the South Holland region. Koninklijke Metaalunie awards this prize every year in all of its regions to a Metaalunie member that positively distinguishes itself on a current theme. This time the theme is 'Smart Manufacturing'.



The jury, led by Jan Post of Philips Consumer Lifestyle, voted tbp as the winner for South Holland: 'tbp has achieved a high level of automation in its process from supplier to customer along with advanced automation of the production process', according to the jury. 'tbp is strengthening its position in the marketplace by offering additional service in the form of early supplier involvement to assist the customer in designing an optimum product in terms of manufacture and testing.' The three finalists - including tbp - attended the national final on 23 March this year. The winner of the national award was HGG International.



“the customer helps to design the optimum product”

tbp is continuing to invest in optimisation and digitalisation of its production process, making use of the latest technologies. This

results in high quality pcba's with maximum flexibility and reliability of supply at the lowest overall cost (TCO*).

Early cooperation with customers (early supplier involvement) and active partnerships with suppliers play a significant role in this. 'The regional prize is a jewel in the crown of the partnership

between suppliers, customers and our employees, because by integrating the chain we can achieve anything in the field of smart manufacturing', says Ton Plooy, CEO of tbp electronics.

*Total Cost of Ownership

metaalunieaward.nl

process optimisation thanks to (re)accreditations



Following the audits in December and February, tbp electronics was (re)accredited with ISO 9001 and ISO 14001. The monitoring body is Lloyd's. These accreditations are confirmation that tbp's basic processes and environmental are in good order. Other standards also constantly motivate the organisation to optimise its processes.



'In addition to legislation and regulations, the current versions focus strongly on risk management and stakeholder analysis', relates Kees du Pree, SHEQ* manager at tbp. 'Corporate social responsibility plays an increasingly important role over the entire life cycle of our pcba's. We are consciously aware of this. We are also focusing structurally on risk management.'

For its work with the military sector, tbp complies with the AQAP 2120 system. Lloyd's has carried out comprehensive audits on this, all with positive results. 'We are increasingly focusing on the medical sector. It is our ambition to obtain the very comprehensive ISO 13485 accreditation for this sector. We are hard at work taking the necessary

steps to comply with this strict standard. These accreditations help us to optimise our processes, in the interests of all those involved. For our customers, this translates into premium quality, custom designs, supply flexibility, sustainable products and the lowest overall cost. We are working enthusiastically towards this.'

*SHEQ = safety, health, environment & quality

DfX for Nikhef: 'complex pcba's require an early design analysis'

The scientists at Nikhef work with the very best measuring equipment which magnifies the very tiniest particles of our world. This takes place mainly in a wide international context. It goes without saying that the electronics which process the measurement data must fulfil the very highest standards. tbp's early supplier involvement ensures that pcba's are manufactured very efficiently and are very reliable.

'We carry out research into subatomic particles which come to earth from space (astroparticle physics) and into particles in our environment (particle physics)', says Ruud Kluit, technical group leader at Nikhef. Nikhef is the National Institute for subatomic physics. 'Detectors measure them and the electronics make them visible. This is how we learn about the basic elements of which we are made up, in the general social interest.'

new developments

'Nikhef is a partnership of five Dutch universities, which enables us to combine all our expertise. Some 80 PhD students and around 50 permanent scientists carry out scientific research on a daily basis with great enthusiasm, financed by the Netherlands and Europe. We develop the complex testing and measuring equipment that we need ourselves. To do so, we

employ around 75 engineers in fields as diverse as computing, electronics and mechanical technology, instrument makers and support workers. New developments and knowledge often find their way into society via start-up companies.'

CERN

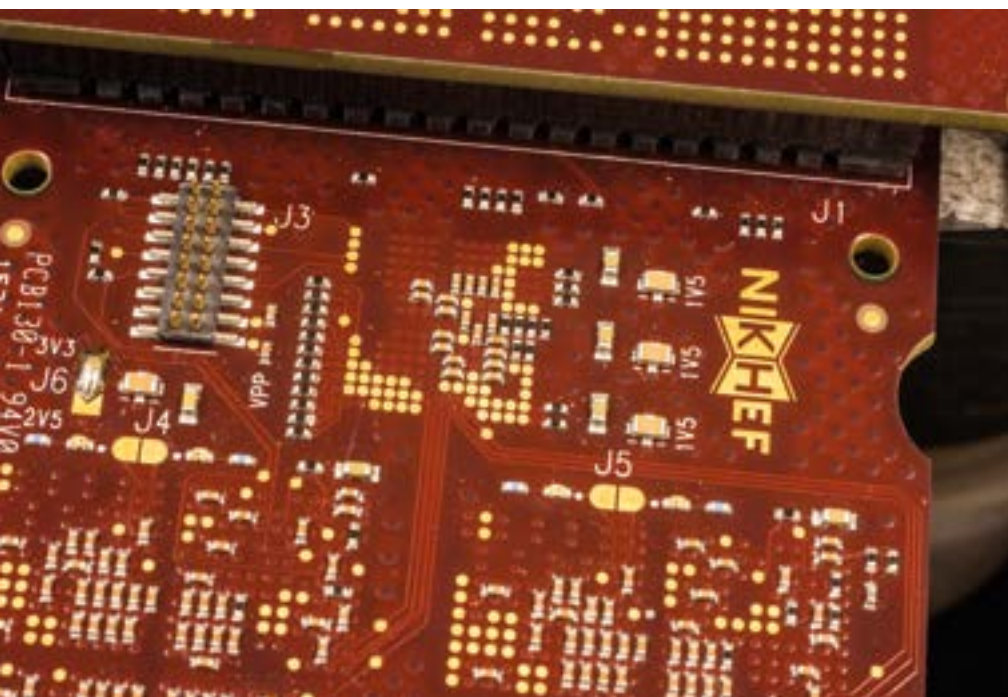
'In Switzerland we are taking part in the CERN* international programme (home. cern). Using a huge particle accelerator - in a tunnel some 27km long - we carry out research into elementary particles. We then allow these to collide with each other

with huge energy, as a result of which they break up into even smaller fragments. All of the equipment is installed underground, including enormous detectors. We develop and supply the electronics for this, amongst other things.'

KM3NeT

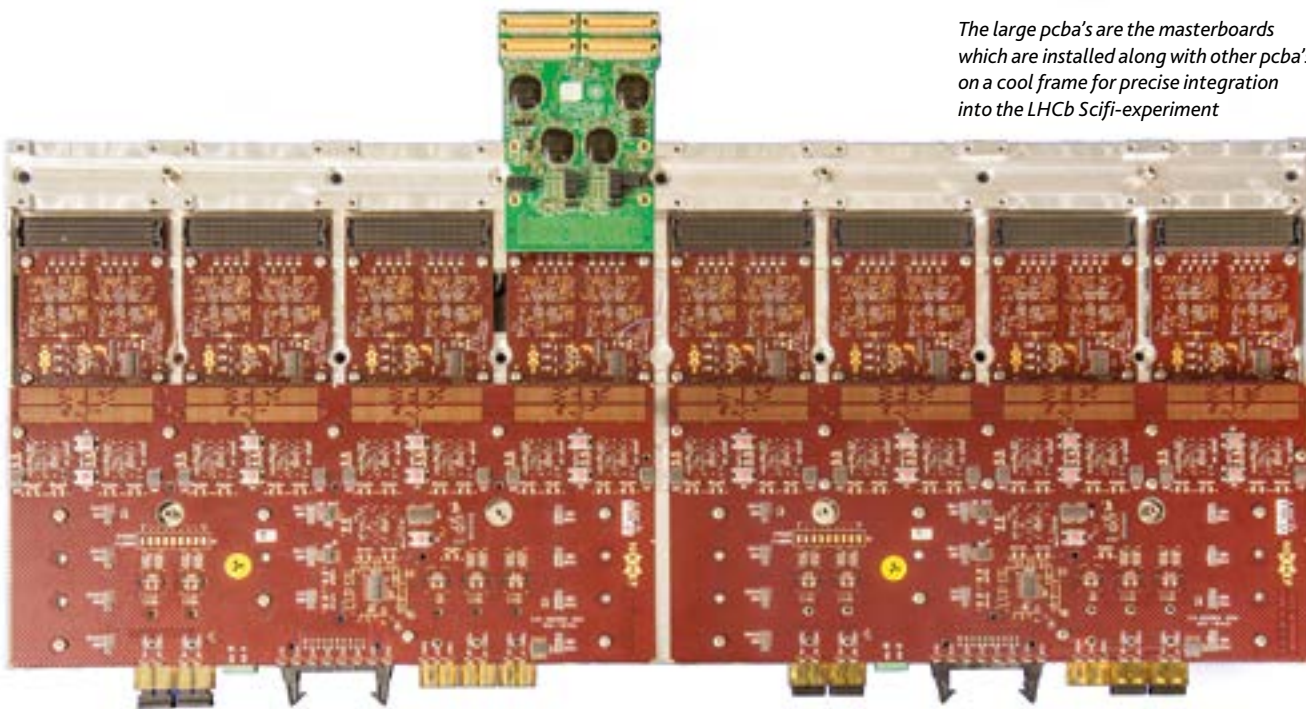
'In the Mediterranean Sea, 4,000 metres deep, in partnership with France, Italy and Greece, we are carrying out research into neutrinos from the universe, which are almost invisible. Muons are created by collisions with the earth, which give out tiny flashes of light in sea water. Some

*“early supplier involvement that's ...
one small step for tbp,
one giant leap for manufacturing”*



Nikhef is the National Institute for Subatomic Physics and forms part of the NWO (the Dutch Organisation for Scientific Research). It is a partnership between five universities in the Netherlands in the field of (astro) particle physics: Radboud University in Nijmegen, The State University of Groningen, the University of Amsterdam, the University of Utrecht and the Amsterdam Free University. Nikhef, established in 1975, is situated in the Amsterdam Science Park.

nikhef.nl



The large pcba's are the masterboards which are installed along with other pcba's on a cool frame for precise integration into the LHCb Scifi-experiment

25,000 underwater glass balls, fitted with light detectors, measure these photons. The environmental conditions require very reliable pcba's with a very long lifespan, because it is not possible for repairs to be carried out. That's why, at the end of 2013, we sought a partnership with tbp.'

optimum process

'The analyses carried out by the DfX specialists at tbp, relate to the manufacturability, testability, reliability and total costs of the pcba's we need. The substantive feedback we obtain leads to improvements in our designs and optimum manufacturability in terms of price and quality, which is why we now use this method for more of our pcba's. Recently, tbp produced for us prototype masterboards for a CERN experiment, and preparation is under way for 50 large pcba's intended for a detector in the Chilean desert with wide temperature fluctuations. In this case we also impose great demands on the pcba's, so a DfX analysis always precedes production. For the production of large quantities, sometimes as many as 500,000 units, we have to purchase in compliance with European tender regulations.'

the importance of DfX

'Very efficient and reliable production of pcba's is very important to the operation of our complex equipment. We don't want any nasty surprises after delivery, as that results in massive costs and puts planning under pressure. There is also the increasing

complexity of pcba's: components are becoming increasingly smaller and production needs to be more precise. Early analyses using DfX are therefore becoming increasingly important.'

*CERN = European Council for Nuclear Research



how could our early supplier involvement benefit you?

We will be happy to inform you! Call or email us for a bespoke presentation.

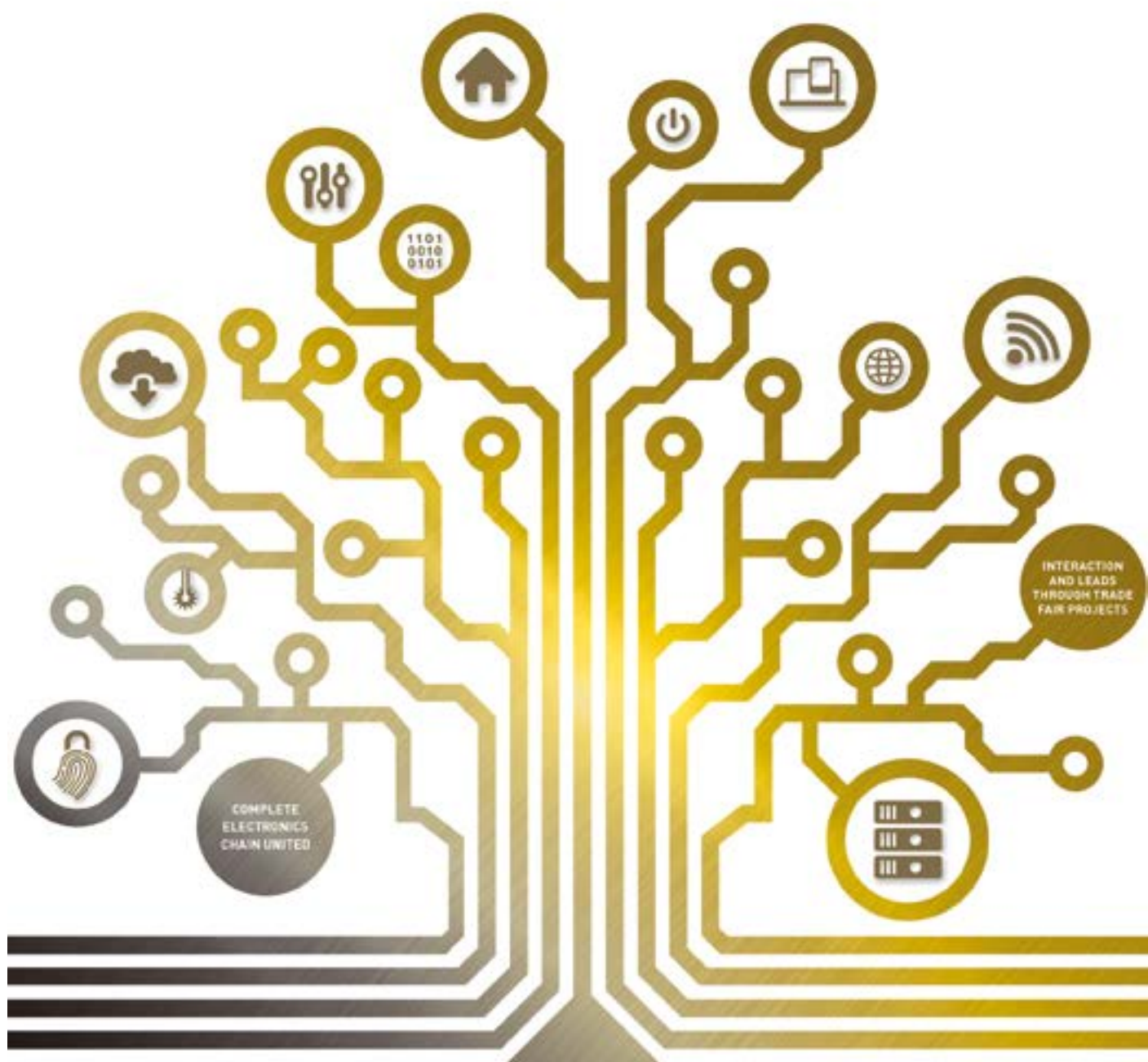
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ELECTRONICS & APPLICATIONS

30/31 MAY & 1 JUNE 2017 JAARBEURS UTRECHT
REGISTER VIA WWW.TBP.NL FOR FREE ENTRY



FHI FEDERATION OF
TECHNOLOGY SECTORS

WWW.EABEURS.NL

'smart product, smart production'

This year, the biannual Electronics & Applications Fair at the Jaarbeurs in Utrecht revolves around smart industry. The entire chain is presenting new developments in the field of industrial electronics which can greatly improve a product. As an innovative EMS operator, tbp is demonstrating its early supplier involvement in the live production line.

This Live Production Integration Line (Live PIL) is a complete line for the assembly of the fair gadget 'KISS LoRa' which visitors can order on registration. Thanks to 'internet of things' functionality the gadgets exchange information with each other at the fair via the national network LoRa. For example, temperature and air humidity data which the appliance gathers thanks to in-built sensors. With Design for eXcellence recommendations in the design phase and with the extended boundary scan test solution, tbp is actively contributing to the Live PIL. The smart software WATS (virinco.com) gives a live demonstration of the test results. Smart product, smart production!

early supplier involvement

In the conference programme, Marcel Swinnen, test & Dfx managing director is presenting tbp's early supplier involvement. 'At the very beginning of a pcba's design phase, we make designers aware of its manufacturability, testability and supply reliability', says Swinnen.

you will find tbp and the Live PIL in hall 7, in the electronics production section

'We make quantified commitments during the virtual design stage. We are the sole EMS operator to include these percentages for production yield (high first pass yield) and supply quality (minimal slip through) as results-commitments in our quotations. With our approach we achieve maximum supply quality at the lowest total cost. The test strategy, including the extended boundary scan test solution, delivers an important contribution to this.'

“maximum supply quality at the lowest cost”

If you visit tbp's stand in hall 7, number E072, you will find more information about tbp's early supplier involvement and a demonstration of test results in WATS. Perhaps even for your own current order!

trade fair presentations

- 31 May 'connecting virtual (Dfx) and real world (big data)': a presentation by Marcel Swinnen of tbp on the first pass yield percentages and slip through calculated during the design phase in association with the actual measured results
- 1 June 'from 3 hours to 20 minutes changeover time': a presentation by Klaas van Duin of tbp on smart solutions which reduced fixed costs, for example by considerably reducing changeover times

Keep an eye on the website eabeurs.nl for the timings of the presentations in the conference programme.

exhibitors drinks party

On Wednesday 31 May from 16:30 we are holding our busy happy hour in conjunction with our trade fair partner Eurocircuits (eurocircuits.be) on our stand. Eurocircuits are providing Belgian draught beer (Moortgat, duvelmoortgat.be) and we will be providing some tasty snacks with live music from Trio Raak in the background (trioraak.nl). You are most welcome!



Electronics & Applications

Jaarbeurs, Utrecht.
Tuesday 30 May to Thursday 1 June 2017
from 9.30 – 17.30
tbp electronics stand: hall 7, number E072
free entry with pre-registration via tbp.nl
eabeurs.nl





Hannover Messe: strong together

At the largest industrial trade fair in the world, the Hannover Messe, Dutch hi-tech suppliers presented themselves under the banner of Dutch Industrial Supply. This is a partnership of the trade organisations NEVAT, Koninklijke Metaalunie, Mikrocentrum, Holland Innovative and Brainport Industries. As a member of this partnership, tbp attended with a stand in the pavilion of Brainport Industries. The joint presentation made the companies much more visible, which improves their position on the international market. Strong together then!



In line with tradition, the Dutch pavilion of supplying companies was situated in hall 4. The trade organisations added to this. In addition to providing stand space, stand building and catering, they organised a central podium where interesting lectures were held. On Monday 24 April, a delegation from Brainport Industries was invited to lunch with secretary of state Sander Dekker. This was an excellent opportunity to put the importance of technical education

on the agenda once more. Exchanges also took place with German network organisations such as NRW Produktion and Baden-Württemberg International. On 27 April, King's Day, NEVAT awarded the *Golden Tulip* to the best Dutch exhibitor in hall 4. There was also a toast to the King during the King's Day drinks party and the Dutch exhibitors enjoyed a pleasant party evening in the *Münchener Brauhalle*.

reinforce the cooperation in the hi-tech manufacturing industry. In so doing, tbp has reserved a space in the current development phase for its dependence test engineering.

right first time

This is the first time that tbp has presented at the Hannover Messe. The theme was right first time with early supplier involvement, which was explained in Steven Van Hout's lecture on the central podium. Thanks to DfX* during the earliest design phase, tbp knows how to optimise pcba's for its customers in many respects, by doing only what is absolutely necessary and doing it right first time. The services DfM, DfT, DfL and DfC** ensure that the customer's design is assessed at a very early stage for manufacturability, testability, supply reliability and total cost. This early cooperation prevents faults and high costs and leads to maximum supply quality.

collaboration

At 80 m², the Brainport Industries stand had a prominent position in hall 4. The central bar with its seating prompted meetings between standholders and visitors. Alongside tbp and other member companies, there was space on the stand for two hands-on 'field labs' and a presentation on Brainport Industries Campus (BIC, brainportindustriescampus.com) in Eindhoven. This location will further





In 2015, Minister Kamp met the Formula Student Team Delft at the Hannover Messe

important meeting place

With Poland as a partner country, there are openings in this market. The prime minister of Poland, Beata Maria Szydlo, accompanied Angela Merkel in officially opening the Hannover Messe on Sunday 23 April 2017. The attendance of many Dutch companies attracted high-ranking representatives of the Dutch government and commercial sector to the fair. As a result, the Hannover Messe was once more an important meeting place. More than 200,000 international visitors attend this trade fair.

* DfX = Design for eXcellence

** DfT, DfM, DfL & DfC = Design for Test, Manufacturing, Logistics and Cost

brainportindustries.com

hannovermesse.de



Precision Fair, 15 and 16 November 2017

right first time



Precision Fair 2017

The Precision Fair in Veldhoven is the pre-eminent meeting place for companies operating in the precision industry. tbp also presented its early supplier involvement. Thanks to Design for eXcellence during the earliest design phase, tbp knows how to optimise pcba's for its customers in many ways. The assumption is always: 'right first time'.

Using DfX* tbp implements this principle by only doing what is absolutely necessary and getting it right first time. The engineering test team in Eersel, with specialists in the fields of DfT* and DfM*, assesses the customer's design for manufacturability and testability at an earlier stage. This prevents faults and high costs. The correct test strategy, for example using the extended boundary scan test solution, leads to maximum supply quality.

The selection of the correct components is of similar importance in this. Specifically, these are the high quality ABC components which tbp always has available. Thanks to DfL* and DfC*, tbp ensures the reliable supply of components and cost-minimisation.

programme

Would you like to know more about our early supplier involvement and its important new perspectives? You are most welcome on our stand, number 210, and to our presentation in the conference programme. The fair's satellite programme covers graduate projects by Dutch technical students who have performed outstandingly in the field of mechanical designs with the presentation of the annual Wim van der Hoek Award. Other programme elements are available on the website precisiebeurs.nl.



Precision Fair: free access

NH Conference Centre Koningshof, Veldhoven
Wednesday 15 and Thursday 16 November 2017
from 9.30 – 17.00

stand **tbp electronics: number 210**

precisiebeurs.nl

Brainport Industries

Just like last year, the member companies of Brainport Industries, including tbp, were visibly present at the fair. They can be identified by the black industry logo on the frame of their stand: the logo of this partnership of hi-tech suppliers.

“Brainport Industries reinforces innovation and competitive capacity”

This binding function is expressed by a new location: the Brainport Industries Campus (BIC) in Eindhoven, intended for the hi-tech manufacturing industry, knowledge institutes and educational establishments. In this way, Brainport Industries is reinforcing the innovation and competitive capability of the supplying companies. The tbp branch in Eersel is expected to relocate to this innovative environment in early 2018.

* DfX = Design for eXcellence and encompasses Design for Manufacturing, for Test, for Logistics, for Cost, etc.

brainportindustries.com/nl/markt-keten/

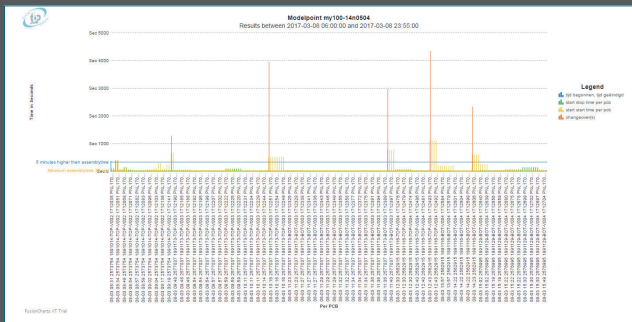
brainport-industries-campus

new analyses thanks to datalinks and dashboards

In line with industry 4.0, tbp is constantly involved in the further automation and digitalisation of its production process. One new development is the datalink and its conversion into clear dashboards. This yields new insights and opportunities to reduce production time and decrease costs.

'Various scanning points in our production process generate a large amount of data', relates Klaas van Duin, production technology manager at tbp. 'By combining these with other available data, for example from machines, we can gain an insight into how long process steps take, what conversion times apply and what the discrepancies and disruptions are. Machine and software suppliers restrict their analysis tools to their own machine or product. Ronald de Jong and Gertjan van der Hiele, our technical application managers, have succeeded in linking data from all the machines and other databases across the entire assembly process. Discrepancies are now reported automatically and operators can provide more detailed information from their expertise. This yields important information during the production process. Following the production and test phase, we have commissioned the first six dashboards for the pick and place-machine.'

The main advantage of the dashboards is that we can present the data clearly in various ways, depending upon the required analysis. For example, a work planner is interested in different information than an operator or production manager.



tbp electronics b.v.

Line 1 quantity: 3 of 120 | expected: 14:59 09-03 | 1800898T-TOP-V003 | 2562744

Machine 1	Time	Machine 2	Time
my100-14n0504	-138 seconds	my100-14n0505	-144 seconds

Line 2 quantity: 80 of 80 | expected: 12:14 09-03 | 1863021-TOP-V005 | 2567082

Machine 1	Time	Machine 2	Time
my100-14n0470	-135 seconds	my100-14n0469	-153 seconds

Line 3 quantity: 10 of 10 | expected: 09:59 09-03 | 1821044-TOP-V001 | 2571337

Links	Time
my19n203	-18000 seconds

Line 4 quantity: 25 of 25 | expected: 12:11 09-03 | 1834423-TOP-V002 | 2574058

Rechts	Time
my19n204	-75 seconds

Line 3 quantity: 10 of 10 | expected: 09:59 09-03 |

Links	Time
my19n203	-5297 seconds

Line 4 quantity: 25 of 25 | expected: 12:11 09-03 |

Rechts	Time
my19n204	1:19 hours

Line 1 quantity: 3 of 120 | expected: 15:03 09-03 | 1800898T-TOP-V003 | 2562744

Machine 1	Time	Machine 2	Time
my100-14n0504	59 minutes 46 seconds	my100-14n0505	41 minutes 17 seconds

Line 2 quantity: 2 of 50 | expected: 20:39 09-03 | 1834433-TOP-V002 | 2566532

Machine 1	Time	Machine 2	Time
my100-14n0470	-964 seconds	my100-14n0469	54 minutes 02 seconds

tbp electronics b.v.

Inforce Alarms

Inforce Unit	Description Alarm	Started	Solved	Info
Hydata 2-1	Send barcode 6170710591 to Jetting - TOP	2017-03-09 13:06:33.997	2017-03-09 13:06:39.443	
Hydata 2-2	Send barcode 6170710842 to Jetting - TOP	2017-03-09 13:31:17.657	2017-03-09 13:31:24.253	
ADI na Reflow 1	Send barcode 6170611749 to Reflow 1 TOP, Reflow 2 TOP, Reflow 3 TOP	2017-03-09 13:39:05.310	2017-03-09 13:07:38.333	
Reflow Oven SMT 2	Send barcode 6170820027 to Hydata 2-2 TOP	2017-03-09 10:24:00.343	2017-03-09 10:24:09.803	rel vdt gekomen
Handmatig Plaatjes SMT 1	Send barcode 79617070307 to Post Reflow ADI 1 BOT, Post Reflow ADI 2 BOT	2017-03-09 09:01:00.123	2017-03-09 09:01:06.580	
Handmatig Plaatjes SMT 1	Job cannot be determined for this barcode	2017-03-09 08:58:08.487	2017-03-09 08:58:10.673	
Reflow Oven SMT 1	Job cannot be determined for this barcode	2017-03-09 08:44:39.333	2017-03-09 08:45:02.943	
ADI na Reflow 1	Job cannot be determined for this barcode	2017-03-09 08:38:48.893	2017-03-09 08:39:11.287	
Hydata 1-2	Send barcode 79617070307 to Post Reflow ADI 1 BOT, Post Reflow ADI 2 BOT	2017-03-09 08:37:01.223	2017-03-09 08:37:07.837	

Line 1	PO: 2559881	Stopped since: 11:32	Layout: 1834077T-V002
MinMaxModaal	Batch	my100-14n0504	
Minimum production time: 971	Produced pcb's: 2 (of 5)		
Median: 1396	Production time: 46 minutes (of predicted 1:56 hours)		
Maximum production time: 1821	Average: 1396		
Starttime	Stoptime	Stopped, Ready	Stopped, Ready
09-03-2017 11:10	09-03-2017 11:56		
Changeover (2) Anders (1)			

Line 2	PO: 2567082	Stopped since: 12:14	Layout: 1863021-TOP-V005
MinMaxModaal	Batch	my100-14n0470	
Minimum production time: 153	Produced pcb's: 55 (of 80)		
Median: 227	Production time: 4:08 hours (of predicted 5:02 hours)		
Maximum production time: 1022	Average: 271		
Starttime	Stoptime	Stopped, Ready	Stopped, missing components
09-03-2017 08:24	09-03-2017 12:32		
Boder (5) Changeover (1) Material: to kort (1) In Board controle (1)			

The questions asked by each manager are answered by providing the right information in a concise, bespoke dashboard. This is a great step forward which helps us to further optimise our production process.'

This innovative development forms part of tbp's Odin project, which is intended to make maximum use of the information in the databases, without extra actions (data enrichment). Right first time, that is always the principle at tbp.



Art in Dirksland

Paul Versteeg and more!

Around the foyer of the auditorium in Dirksland, tbp is displaying the work of regional artists. During the coming months this will include the port photographs by Paul Versteeg.

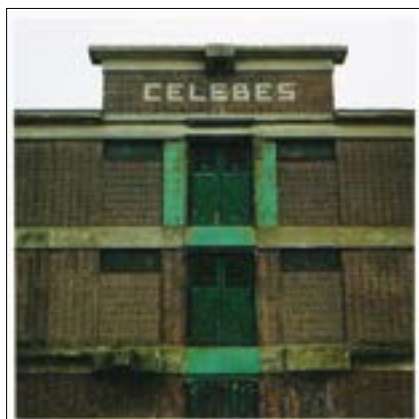
Following his training as a graphic designer, Paul Versteeg branched into photography at the Academy of Art & Design in St. Joost. In 2005 he was nominated for the Steenberg Stipend for Photography. This prize is awarded annually to a photography student attending one of the Dutch art academies with the aim of providing further support.

Paul Versteeg records his subjects in a penetrating, almost documentary style, borne out of close involvement and often in black and white. He has photographed people in Naples in Italy, veterinarians and farmers in his home surroundings of

Andel, North Brabant and various birds in the Port of Rotterdam. He portrays this fascinating world with a close eye for detail.

“hands have been replaced by gigantic cranes”

You are most welcome to admire the artistic images of Paul Versteeg and other artists during your business visit.



our port

What remains after the strict safety requirements imposed following the attacks in the US and the increasingly larger ships which more closely resemble gigantic corpses than the romanticism in 'Alleman' by Bert Haanstra (<https://youtu.be/pptxLNugXlk?t=5m26s>)? The relationship between the town of Rotterdam and the port has also changed dramatically. From an attractive inland port to a highly modernised industry on an artificially-built part of the Netherlands.

Yet amongst the apartment buildings which sail between the continents and which convey raw materials from strange lands, remains the essential Rotterdam, pragmatic and proud. The roughness of worn materials on people and the toughness of the steel on the mentality. The easy-going way of life has been replaced by the computer, hands for gigantic cranes, but the man or woman on the quay remains the same.

Rotterdam or the Netherlands will no longer leave the same impression on exotic seafarers as in the past because they load and unload efficiently somewhere outside the city, but this gigantic area certainly left its impression on me.

Paul Versteeg



tbp customer & supplier days

no time to waste: opportu

The customer & supplier days held by tbp electronics attract many interested parties. On 5 April, tbp welcomed almost 100 clients to its own auditorium in Dirksland. With the theme 'no time to waste' the discussion leaders Arjan van Weele and Maarten Steinbuch, both professors at the TU Eindhoven, discussed current themes with sector experts and those present in the hall.

management revolution

'The technological industry is of the utmost importance to the earning capacity of the Netherlands', according to Ineke Dezentjé Hamming-Bluemink LLB, president of FME. 'The government has not paid sufficient attention to this. We must continue to manufacture and innovate in the Netherlands. Industry 4.0 is not only a

technological revolution, it is more of a management revolution: revamped business models lead to success more quickly. Field labs, in which companies, knowledge institutions and education institutions cooperate, are crucial to radical innovations.'

educational growth

'The Technology Pact is intended to improve the link between education and the labour market in the technology sector, but it is not effective', emphasises Ineke Dezentjé. 'We focus strongly on politics which is financially responsible, but at the moment we need many practical initiatives, for example vocational educational institutions which are set up in conjunction with educational and knowledge institutions. Education is not

growing quickly enough.' This is also the experience of Dennis Schipper, managing director of Demcon. 'Human capital is a mutual challenge. This year, we certainly need around 100 new technical colleagues, but they are nowhere to be found.'

collaboration.

'Technical students' mobility is restricted', according to Schipper. 'We locate ourselves in university centres and work closely with universities to educate students. The attraction of our challenging projects and a close-knit family culture helps us to bind these young people to us.'

'tbp also experiences the benefits of a family culture', confirms Ton Plooy, CEO of tbp. 'This translates into a great sense of involvement. The work ethic in this area is



Dutch industry has a great deal of potential. Everyone at the table for 'no time to waste' was in agreement about this. The challenges to continue to play a significant global role are great. How can we achieve growth, shorten the time-to-market and reduce the cost of failure? Chain partnerships and education continue to be absolutely key to this.



nities for industry

also very high and we have a strong customer focus. I view our employees as VIPs who determine the success of our organisation. That is a unique value. "No time to waste" is all about cooperation. Engineering and production have been dissociated due to the emergence of low wage countries. We need trust and openness to work together optimally at an early stage. We achieve this through our supplier involvement and Design for eXcellence.'

project-based working

As initial buyer at Anteryon, Saskia van Dun has a mediating role between engineering and production. 'To bring innovation and implementation together in the initial phase of a project requires common sense and communication skills.

Engineers are primarily optically focused. If we know how to utilise the expertise of suppliers like tbp, we can grow and retain our global advantage. Educational establishments can stimulate that cooperation by teaching students to work together in a project-based way.'

Anne de Graaf, Civil Technology student at TU Delft and sensor & sensor nodes engineer for the Formula Student Team Delft, consciously sought out that project-based working method. 'As a team member I am learning to take responsibility and to arrive at solutions. The electric racing car that we design and build in ten months is a challenge. As a sponsor, tbp has analysed our designs and provided useful feedback about the electronics. We will not learn perfect

design within our educational programme. Education must provide more scope for creativity and self-development.'

no time to waste

Arjan van Weele and Maarten Steinbuch closed the successful afternoon. They concluded that young people inspire enormously and with their unique questions and solutions, they provide crucial development. Partnership is another important pillar, specifically given shape in the successful field labs. The link between education and practical experience, at all levels, requires many small-scale initiatives, which can provide growth in the short term.

In short: no time to waste!



René Raaijmakers, director/owner of Trendwatch and The High Tech Institute, follows the hi-tech industry with great interest. He sees robotics as one of the most significant developments. 'The ability to work in a team is a significant competence which researchers at Natlab (Philips Physics Laboratory) possess.' Raaijmakers wrote the book NATLAB, which was published last year, based on their stories. June sees his book 'The architects of ASML' launched on the market

For more information about both publications please go to twitter.com/bitschips



going forward together

Chain cooperation was a significant conclusion of the supplier day on 6 April.

One link is no longer able to develop far-reaching processes. As with the customer day, the discussion was led by Arjan van Weele. Supply chain manager at tbp Hanneke van Wageningen was also a leader of the discussions with sector experts and the suppliers in attendance.

'Companies like tbp challenge Mycronic to enhance the usability of machines', according to Paul Rooimans, managing director of this Swedish SMT assembly line specialist. 'tbp stimulates the market to extend boundaries.' In order to bring developments together, both companies have an intensive partnership arrangement.

smart software

Also at the table sat Paul van Abeelen, CEO of Isah, a supplier of business software to the manufacturing industry. With the provision of free courses, Isah is stimulating the optimum utilisation of ERP opportunities. Experts have established that time-savings can be achieved when training sessions are no longer required because software is more user-friendly. 'The technical software we require is much more complex', emphasises Ton Plooy. 'We have made considerable investments to allow machines to communicate with other. Suppliers are insufficiently able to help us with this. But we don't want equipment, we want an automated process!'

Smart machine software must inform operators, rather than the other way around. Even an automated component order generated by the machine to the supplier must be achievable. This means process steps and (stock) costs are reduced. The role of software in the process will increase even further.

components

The availability, delivery time and price of components is receiving insufficient attention in the design process.

'Customers sometimes design boards containing components which are no longer available at the time of production', identifies Richard Mijnheer, CEO of design bureau 3T. With early supplier involvement, the gap between designer and manufacturer can be prevented.

The flexibility of components could also be better. The entire room called for smaller volumes, Plooy asked for components with all the parameters in one barcode and Van Wageningen wanted feeders which are delivered along with the components. Rens Wagter, general sales manager of component supplier EBV Elektronik was open to these suggestions but pointed out that there are problems associated with them. For example, we have to deal with many different machines.' 'Then let's develop machines which no longer need feeders!', added Plooy.

for and by the entire chain

No time to waste can only be resolved jointly. Cutting-edge chain cooperation is also necessary in the view of Anne de Graaf, Civil Technology student and at TU Delft and sensor & sensor nodes engineer of the Formula Student Team Delft. And according to her, educational courses need to take a major step forward! She would like to see the entire chain as a bit less "1980's"!

The discussions at the customer & supplier days were interspersed with musical interludes by [De Swingers](#) and concluded with a humorous summary by puppeteer [Armand Schreurs](#). The positive reactions from those present emphasised the value of both afternoons to the entire market.

“focus on cost drives out quality, focus on quality drives out cost”





For photos please go to the website opendag-watertoren.nl

lively open day at De Watertoren



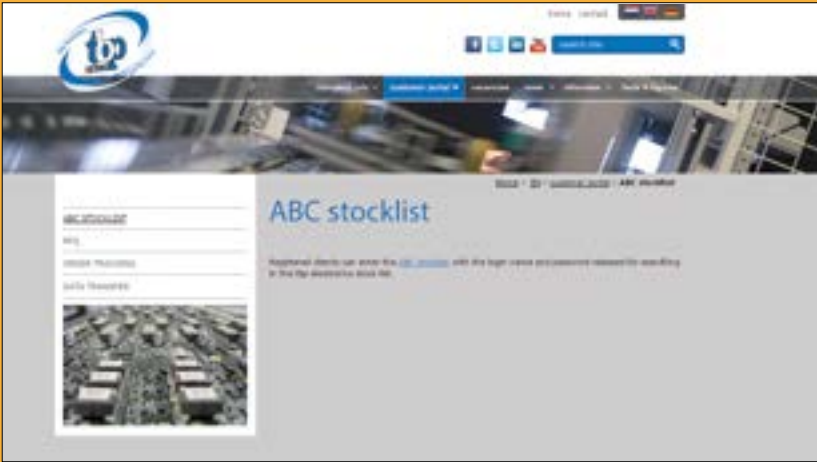
With eleven participating companies, the open day for the industrial estates in Dirksland was a major event with over 600 enthusiastic visitors. tbp organised its first open day exactly 25 years ago, but now a partnership with the other companies on De Watertoren was first sought, with great success.



Brass band music, drinks and snacks, abseiling down the water tower, a foam party with festive bubbles and various activities for all participants brought the brewery to life. At tbp, the assembly facility was open for all to see, with a guided tour. Younger visitors were able to assemble and solder an electronic gadget which reacted to sound that they could take home with them. In the hall there were demonstrations of 3D printing, the customer portal and order tracking on a giant iPhone.

Not only mayor Ada Grootenboer of Goeree-Overflakkee visited each company personally, but also various neighbours, family members and other interested parties from throughout the region. The many full stamp cards showed that visitors had taken a look at all of the premises and were eligible for some fantastic prizes from surrounding businesses. The activities and the beautiful weather made it a great day out to remember for both organisers and visitors alike.





even better service thanks to the tbp customer portal

With its online access to functional modules, tbp is serving its customer even better. Thanks to a personal login code you can request a proposal online, consult the ABC stock list and monitor the progress of your orders. The next step is real-time insight into the test results for your order. This gives you even more understanding of production and your process.

proposal request

The online proposal request facility has been available for some time, with the option to safely upload your product information via Cryptshare. Access to our ABC stock list provides you with insight into the best components, prices, availability, specifications and images. Using the search function you can select the components which optimise the manufacturability and testability of the pcba at the earliest possible design phase. So, together with you we achieve the maximum supply quality at the lowest total cost.

order information

Via the order tracking module (also downloadable as an app) you can monitor

the status of your order: how far along the production line it is and which completed pcba's are already available to you from stock. A new development is online access to the test results for all test set-ups in use via the WATS software package. We are working on a dashboard which will present the information to you clearly and concisely. This new module will be available to you later this year.

customer portal requests

Are you interested? You can request a personal account from Dana Wolters via info@tbp.nl. Customers can use this to access all of the modules in the customer portal via the website tbp.nl.

“The order tracking module in the customer portal of tbp electronics provides insight into the components tbp has on stock. This is especially useful for urgent orders from our customers. It also provides valuable information such as order status and despatch dates.”

Ekaterina Raykova, Honeywell

DfX by tbp

Next month, following an intensive period of production, the Delft team unveils its new electric racing car: the DUT17. As a participant in the Formula Student Competition, the Dutch team has achieved good results in this annual engineering challenge. Thanks to the pcba's and DfX analyses from tbp, the students knew how to improve their design. The racing car's performance will be proven this summer. But first there is a lot of work to do...

Pietro Areso Rossi, Oscar de Groot and Anne de Graaf are spending a lot of time on this project. Pietro and Oscar are even working full-time as members of the core team. In the Dream Hall at TU Delft, 75 students from various disciplines are designing, building and testing an electric racing car with newly optimised design features. Whereas in previous years attention was paid to weight, tyres, four-wheel drive and aerodynamics, this year the focus is on active shock absorption in order to improve acceleration. With 0 to 100 km/h acceleration of only 2 seconds at forces of up to 3.5g, the Formula Student Teams have broken several records, which is an amazing performance.

DfX-analysis

The DUT17 is full of electronics which control the racing car and measure its functions. tbp's pcba's - around 120 in total of 14 different types - play an important role in this. Following three previous years



helps Delft's race team on its way



of involvement, tbp is sponsoring the Delft student team by supplying these components, along with an invaluable DfX analysis of their design. Thanks to the extensive and structured reporting, the students could greatly improve their technical efforts, certainly following a useful presentation and tour of the assembly facility at tbp in Dirksland. 'As a result, we understand much better how design and assembly are linked to each other and how much of the process is fully automated', adds Anne.

personal objectives

In addition to the educational and sporting challenges of the Formula Student Competition, the students have their own personal objectives. 'For me it's about the professional work experience and the development of soft skills', says Pietro, the team manager. 'The way we work together as a team determines to a great extent whether we succeed. All students participate voluntarily in this project, some of us up to 80 or 90 hours per week. With a firm goal and a fixed deadline for us, we have to deal with stress and emotions. It is very instructive to be able to manage everything smoothly within the financial and practical restrictions we have.' For Oscar and Anne too, operating in a team environment and the focused and pressured application of knowledge are educational experiences. 'The sensors, for which I am responsible, affect pretty much every department', explains Anne. 'I actively seek consultation.' 'For me, insight into the operation of the electronics is also important: where can gains be made', adds Oscar.

challenge

The Delft team is steadily moving forward, despite the many challenges. Following the presentation in the Market Square in Delft, the students will continue to enhance the racing car to optimise performance. After testing in South Germany, the real work begins in the summer with races in Hungary, Germany and Spain. Since 2011, Team Delft has won four of the six German races. The goal for this year is to win again at this circuit, in the most prestigious competition in the world.

driver

The selection of the driver is a project in itself. After a couple of karting sessions with the team, the selection process begins. In addition to skill, physical fitness and stress-resistance are critical factors. At the Market Square in Delft, this honour falls to team manager Pietro, but after that a selected and trained driver will take over the driving duties. The application process is currently under way.

fsteamdelft.nl

[fb.com/fsteamdelft](https://www.facebook.com/fsteamdelft)



Oscar de Groot (Electrical technology student, DUT17 chief of electronics), Pietro Areso Rossi (Aerospace technology student, team manager DUT17) and Anne de Graaf (Civil Engineering student, sensor & sensor nodes engineer DUT17).

Anne participated as table expert in the talk show "no time to waste" during the tbp customer & supplier days on 5 & 6 April 2017! See also pages 12 to 14.

each of the four new turbines in the scaled-up Battenoert wind farm supplies as much energy as the previous seven turbines combined

photo: © Anne de Groot



sustainable energy thanks to Deltawind

Thanks to its own investment in sustainable energy, the entire energy requirement for Goeree-Overflakkee (South Holland) has been met. Deltawind has played a major role in this story. The cooperative is an initiative by several local residents and currently operates 16 wind turbines and a solar farm.

Around 28 years ago, several island residents pooled their savings and purchased a wind turbine. To manage this initiative for the generation of sustainable energy on Goeree-Overflakkee smoothly, Coöperatie Deltawind was founded. 'I look back with amazement at the first 13 years, during which the cooperative was run entirely by volunteers', says Monique Sweep, director van Deltawind. 'They invested their profits back into sustainable energy, which made quicker growth possible.' In 2002, the organisation became professional. Deltawind currently has five full time employees and more than 2,200 members.

“electronics plays an important role in all developments”

energy

Deltawind operates 16 wind turbines in two locations, including the refurbished Battenoert wind farm in Nieuwe-Tonghe. Together, the turbines generate sufficient energy for all of the households and businesses in Goeree-Overflakkee. In 2012, Deltawind constructed the first solar farm to generate power for De Klepperstee leisure park in Ouddorp. The cooperative

actively sought partnerships, including one with Zeeuwind in Zeeland. Together, they invested in 34 turbines for the Krammer wind farm on the Krammersluizen. 'In the past we could only supply the power generated on the general network via energy suppliers', continues Sweep. 'Since the opening of our new wind farm in Battenoert, individuals in the Netherlands can now purchase green power directly from this wind farm, via the Vandebroon platform (vandebron.nl). We think that using energy generated by your own wind farm is a fantastic development.'

developments

'The thing we have in common with tbp electronics is that we both take great pleasure in technological developments. Even wind energy is continuing to develop in terms of electronics and design. We are continuing to investigate other technologies as we can't just continue to build wind turbines endlessly. In order to control fluctuations in supply and demand, storage is an important area to focus on. Nowadays it is often much too expensive, but even here development is

ongoing. Electronics has an important role to play in all of these developments.'

energy neutral

'The government converts European objectives in the field of wind energy into local objectives', explains Sweep. 'The borough of Goeree-Overflakkee has promised its cooperation, without outsourcing outside the region. That was a good decision. The borough established where the wind turbines go and developers like Deltawind implement that objective. Due to this local involvement Goeree-Overflakkee will be energy-neutral by 2020, which is unique for an island globally. An exceptional performance.'

deltawind.nl



sustainable Greenpoint filling station and more in Oude-Tonge



The new filling station in Oude-Tonge is an exceptional facility with a restaurant, meeting room, shop and car wash, all designed to a 100% sustainable concept. This Greenpoint site, called Holland-Zeeland, strives toward the transition of sustainable energy to mobility, without the emission of CO₂. Most of the facilities operating in and around the station are fully energy neutral.



Tonnie van Peperstraten of the Van Peperstraten Group is the driving force behind the Greenpoint sites which are expanding across the Netherlands. Each Greenpoint site gets a unique combination of facilities, linked to the sustainable filling station with alternative fuels. Van Peperstraten: 'Each Greenpoint is different, but our principle is always the same: full sustainability. In 2010 I began to think about how to make agricultural businesses more sustainable in conjunction with a sustainable filling station. I also attempted to join up the entire circle in partnership with partners like Van Kessel Oil, Stedin, Eneco, Linde, Siemens, the province of South Holland and the borough of Goeree-Overflakkee. We approach the market as widely as possible.'

fuel mix

'At the filling station we offer the entire range of fuels, so that everyone can use it and therefore the filling station is profitable. The demand for alternative fuels in the meantime is continuing to grow.

hydrogen production

Electricity splits water molecules into hydrogen and oxygen. At a Greenpoint site this is done using sustainable energy.

Hydrogen:

- provides electricity for electric motors
- can provide temporary storage for sustainably-generated energy
- can be converted into ammonia if required

We promote this, for example by entering into discussions with transport companies about fuel for commercial vehicles. We are also going to be supplying hydrogen to Connexxion for the hydrogen buses which will operate daily between the hospital in Dirksland, Oude-Tonge and Rotterdam-South.' In the exclusive Goeree-Overflakkee/Hoeksche Waard licence, four hydrogen buses will be utilised. 'Our aim is for every fuel card to be valid for fuelling, thanks to agreements with various oil companies', says Van Peperstraten. 'Alongside fossil fuels, the station will supply several gases (CNG, LNG and bio-LNG), the fuel additive AdBlue and hydrogen. There will also be charging points for hybrid and electric vehicles.'

sustainable energy

Greenpoint Holland-Zeeland will be around 500 metres from the agricultural business of the Van Peperstraten Group. Solar panels on the roof of the barn generate more energy than the company requires and the same applies to the rainwater captured. The excess supply of energy and purified water is used in the filling station for facilities such as the charging stations and the car wash. 'Even our own wind farm on Goeree-Overflakkee provides a supply of sustainable energy. An installation on this Greenpoint site utilises these sustainable energy sources for the generation of hydrogen via electrolysis (see panel). That is unique in the Netherlands.'

With its many wind turbines, solar panels and the future tidal generator on the Brouwersdam, Goeree-Overflakkee is increasing the amount of sustainable energy it produces. In partnership with Stedin, the excess supply of sustainable energy on the energy network will be converted into hydrogen and stored in



tanks at the Greenpoint Holland-Zeeland site, for times when there is a greater need for energy.

“Goeree-Overflakkee fully energy-neutral by 2020”

energy neutral

'We are constantly establishing contacts with authorities and market players to increase the supply of and the demand for sustainable energy and alternative fuels. Partly thanks to Greenpoint Holland-Zeeland we are making a contribution to the aim of the borough of Goeree-Overflakkee to be fully energy-neutral by 2020.' Greenpoint Holland-Zeeland in Oude-Tonge becomes operational in October 2017 and construction has already started.

vanpeperstraten.nl
greenpointgroup.nl

3D-print experiences left people wanting more!

The 3D-printer has acquired a permanent place at tbp by manufacturing useful production tools. Klaas van Duin and Frank van Dongen are convinced of the possibilities, although there are still some obstacles to overcome. A more advanced 3D-printer is on their wish list to build up further experience.

'Together with the production workers I develop tools which simplify the production process', explains Frank, a mechanical engineer at tbp. 'We can print or part-print more and more ourselves. I design using the software Solidworks. The major benefit is that we can make and adapt the tools quickly ourselves. We are not dependent on the capabilities and delivery times of a supplier. The 3D-printer offers us flexibility, saves time and money and contributes to the quality of the end result.'

clarity

'What's more, the 3D-printer helps us in discussions with our customers and suppliers', says Klaas, production technology manager at tbp. 'For example, at an early stage, we can explain our ideas to machine manufacturers thanks to a printed prototype, such as an adapted feeder for the pick and place-machine. Printing a test model creates a great deal of clarity.'

developments

Even though the Ultimaker 2 is an entry-level printer, tbp is already gaining significant 3D-printing experience on it. 'After all, you don't learn to drive in a Ferrari.' The next printer Klaas and Frank have in mind will have at least several heads to combine various materials and will be able to withstand higher temperatures.

custom design

The ultimate goal - to be able to print a pcba completely - is still a long way in the future. Klaas van Duin sees the 3D working group of NEVAT EMS technology group, of which tbp and other partners are members, as an important stimulator to accelerate this development. 'The ability to print the complete product in one go gives us the possibility to create much more complex designs and to have smaller production runs. Because of these benefits, it is very important for 3D technology to continue to develop, naturally whilst maintaining quality. We can then provide our customers with a more customised service.'

solidworks.nl
ultimaker.com
tg-nevate-ems.nl



several 3D-prints made with the Ultimaker 2

