



Exchanges of Practices in Education for Climate Targets (EXPECT)

Visit to Den Bosch, Netherlands

The final meeting of the Erasmus+ funded international project on the Exchanges of Practices in Education for Climate Targets (EXPECT) took place in May 2023 in 's-Hertogenbosch, also known as Den Bosch, in the North East Brabant region of the Netherlands. This beautiful city of 150,000 people lies between Eindhoven and Utrecht/Amsterdam and is known as the home of painter Hieronymus Bosch (1450-1516).

EXPECT project co-ordinator Manfred Polzin from the Dutch association of colleges (MBO Raad) provided a comprehensive introduction to the VET system in the Netherlands, touching on some of the recent history including system reform, large scale college mergers and colleges' relationships with employers and sector skills bodies as well as other stakeholders. Students in the Netherlands can study energy-neutral design and construction, sustainable electrical and mechanical installation, charging station technology, waste and recycling technology, wind turbine maintenance, Hydrogen technology and transport technology amongst other options within green skills.

We were welcomed to our host college, Koning Willem I, by Dominique Majoor from the board of directors. The college is a VET provider with 17,000 students and 1,700 staff across 16 campuses in 5 cities in the area. The college offers courses in engineering, construction, transport, energy, logistics, health and social care, education, sport, retail, ICT, creative Industries, hospitality, catering and business services.

Koning Willem I has a long-standing commitment to sustainability which informs every aspect of the college's work and is communicated to staff and students. The directors have signed up to a charter based on the UN Sustainable development Goals (SDGs) and have developed a clear vision, with every department invited to set ambitious targets to contribute to these goals. The whole-college approach addresses the 'why, what, how, where, who and with

whom?' of every aspect of sustainability with an annual self-assessment against clear criteria. Facility management has set a good example in terms of energy and water use, waste, catering, mobility, biodiversity and purchasing and the college regularly wins national sustainability awards.

In the college's region of Brabant, VET institutions have worked with technology companies on a €3.4million energy transition project and the Koning Willem I's automotive department is becoming a centre of excellence for electrical and hydrogen powered vehicles. Additional funding is available for education to prepare for the energy transition and there is a national digital platform 'BuildupSkills' to share high quality learning materials.

One of the most active and long-standing advocates for this work at Koning Willem I is our EXPECT team colleague, the indefatigable Rob de Vrind, widely known in Den Bosch as the 'City Biologist' or the 'Orchid Man'. Rob is well-informed and pragmatic and has devoted his career to maintaining the momentum for change on environmental issues. Rob can take much credit for the college's commitments and its values, and he is clearly a wonderful role-model for his colleagues and students.

The college's two main campuses, on Vlimenseweg and Onderwijsboulevard, have been retrofitted and redesigned to be as sustainable as possible, with 1,000 solar panels, double glazing, CO₂ sensors, comprehensive air treatment systems, atmospheric heat recovery, LED light, movement sensors, water tap sensors, efficient toilets installed, and all gas boilers removed. 36 heat pumps provide all the additional heat required, with one group achieving 25°C from the air and a second set using soil heat to achieve 65°C.

A distinctive aspect of the college's educational offer is the 'Talent Atelier' where students from all disciplines come together in mixed groups for one day a week over 10 weeks to work on challenges identified by employers, local authorities or community groups. Bert Verhoeven and Sam van Beek introduced the teaching methods used to support students with problem-based learning, developing teamwork and creativity. We saw nursing, media and construction students working together in interdisciplinary groups. Students are expected to work up their design concepts and build prototypes and present them to clients.

We also visited the construction department and saw how students are expected to design sustainability into their projects, carrying out cost calculations and following through with increasingly complex briefs; designing a small holiday home in Year 1 and a more substantial detached house in Year 2. We also saw

some state-of-the-art groundwater and atmospheric heat pumps in action as well as in the workshops where the college runs courses to train engineers to install and maintain the growing number of heat pumps.

The Netherlands currently requires around 3,000 PJ (1 Peta Joule is a million billion Joules) of energy per year. Other than domestic and transport energy use, other big users include Rotterdam harbour, the steel industry, fertiliser and chemical industry, intensive agriculture and export driven industries. The country has had to shut down its domestic gas extraction which was worth €400billion and invest rapidly in new renewable infrastructure, capacity and the associated training. The Netherlands currently generates around 2,300 PJ with 10% of its energy coming from solar, 18% from wind, 28% from biomass and 37 % from waste incineration. There has been substantial public investment in the transition and the country has the highest proportion of solar panels in Europe per capita and a large number of wind farms. But the Netherlands will need the equivalent of 97,000 windmills from a current baseline of 3,000, quite a task!

As with each of our visits, this one helped us to build up the Europe-wide picture of what best practice looks like and what might be transferable between national VET systems. What we saw at Koning Willem I is how much can be achieved when political and institutional commitments are aligned and well-resourced. Even so, the challenges of decarbonisation and transitioning to a sustainable economy are enormous. In curriculum terms, Koning Willem I shows how a large multidisciplinary college can use the diversity of their offer to promote interdisciplinarity and problem-based learning which can integrate the development of students' research and collaborative skills with their specialist vocational knowledge and skills.

The EXPECT project may be coming to its end, but the learning and sharing continues!

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