



Macom has brought energy provider TenneT's vision on how to communicate an 'energy revolution' to life with a new experience centre in Berlin.

Experience the energy

Electricity provider TenneT supplies a staggering 41 million customers with electricity every single day. A recent drive to explain its activities as part of the wider “energy revolution” meant it needed a way to captivate visitors from politics, corporations, the energy industry, media, stakeholders from grid expansion projects, universities and schools. It first engaged the services of creative agency die wegmeister who then, in the autumn of 2016, drafted in Stuttgart headquartered consultancy macom to work out a plan to implement the concept. The result was the TenneT Virtual Vision centre.

With anyone from a politician to a school child likely to walk through the doors the team had a challenge to design a facility that would make concepts such as the social challenge of the energy revolution and the associated tasks of the power grid operator exciting and tangible. What's more they only had 11 months to oversee delivery and integration of the system into the fifth floor of an existing office building that was also undergoing wider renovations.

“How do you inspire people about a fact – electricity – that society perceives as given?”

- Florian Polley, TenneT

Florian Polley, project manager/communications at TenneT, says: “How do you inspire people about a fact – electricity – that society perceives as given? How do you explain the task of a company that realises the biggest structural change in the Federal Republic – namely the energy revolution? This is only possible by making content come alive.”

Heavy use of immersive and interactive AV technologies, as well as virtual reality, was planned to engage and entertain visitors, while educating them on the challenges of energy transition.

With only 11 months to go before opening, macom first embarked on a feasibility study to provide TenneT with a reliable overview of the requirements of implementation, which technologies and systems would be reasonable and what they could expect the final bill to be.

An operational concept for the AV technology was drawn up and technical aspects of the AV systems planned. A key part of the design was modularity and scalability to allow the centre to be extended and allow TenneT to take individual components of the experience centre and use them at trade fairs.

In addition to planning, macom was on site working with integrator Studio Hamburg Media Consult International to ensure the concept was delivered as designed.

Eight distinct information areas were included in the 260 sq m facility to communicate the energy revolution with content generated by die wegmeister and VR Bits.

The tour starts and finishes with 180-degree projection using four short-throw Epson EB-G7905U projectors mounted with Chief projector mounts and fed by a Picturall Quadro

< Mark 2 + media server. Lightware TPS-TX95 HDBaseT transmitters and Extron DTP T FB 332 transmitter and DTP HDMI 4K 330 Rx receiver. Audio is delivered by Fohhn LX-10 ASX active loudspeakers and AS-06 ASX active subwoofers.

The content uses CGI animation with motion graphics and introduces visitors to the tasks of TenneT as well as the company's immediate, intermediate and long term projects and solutions for sustainable energy transfer.

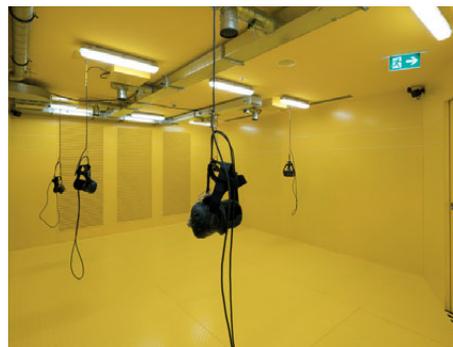
Virtual reality is introduced at the second station where a Samsung Gear VR system is coupled with Sennheiser HD201 headphones for an immersive experience.

Station three uses an 84-in Samsung QM85D LED screen mounted on a Chief XSM1U mount to show digital motion graphics to symbolise and atmospherically convey the areas TenneT

works in including energy transmission, data projects, wind energy and solar energy. HDBaseT extension is again handled by Lightware. Alternative 4K film content that targets specific groups can be played here and the visuals are accompanied by focused audio delivered by a Sonus Audio Focus Q sound shower. The main display is supported by info points that use 22-in TF2234MCX Iiyama displays mounted in steel enclosures.

Interactivity is introduced again at station four where visitors can play a game on a UHD multitouch table, already owned by TenneT and repurposed. It uses object recognition to allow up to four people to plan new power lines in a densely populated area and demonstrates just how tricky that challenge can be. Ecological, economic, socio-societal and temporal factors all come in to play as visitors play the game.

Station five is dominated by an 8K videowall, made up of



Images from TenneT TSO GmbH

eight X554UN-2 55-in NEC flat panel displays in a curved 4 x 2 arrangement, mounted with Chief LSM1U brackets. It's fed and controlled by a Picturall Quadro Mark 2 + media server and Datapath FX4/H videowall controller while Lightware once again handles HDBaseT signal extension. Visitors can control content on the videowall using a 22-in TF2234MCX Iiyama monitor. The visuals are supported by two Fohhn LX-10 ASX two-way loudspeakers with DSP and two Fohhn AS-06 ASX subwoofers.

The screen is used to simulate a control centre. Visitors feel as if they're there, looking over the shoulder of system management engineers as they view live data from the TenneT control centre in Lehrte. The data link had to be handled carefully because of data security considerations. Informative films can also be selected using the control panel.

To show future plans for the TenneT brand, as well as its upcoming projects, macom has specified a mixed reality application for station 6. Using Microsoft HoloLens glasses, MR content can be viewed - and controlled via gesture - on top of a number of physical cylinders included in the room. Speakers are integrated in the glasses to also deliver three dimensional audio.

Station seven takes visitors out to an offshore platform on a virtual reality helicopter ride using HTC Vive VR goggles. Visitors are tracked so they can move around and explore the offshore platform. Sennheiser HD 201 headphones deliver immersive audio that is supported by I-Beam VT 200 bass shakers in the floor driven by two QSC PLD 4.2 amplifiers. Individually controlled air currents complete the experience.

A central control room was planned to house the technology required for playback and control of AV technology. Equipment located in the two 19-in Rittal racks includes Barco Clickshare. Extron handles HDMI signal distribution with a DA4 HD 4K HDMI distribution amplifier and SW HD 4K HDMI switchers. A Yamaha MRX-7D and EXI-8 look after audio processing with distribution taken care of by a Fohhn AM-50 master module. An Extron MIX 301 three channel audio mixer was also selected. Crestron was chosen for the control system with a CP3N at the heart of a system that is accessed via an Apple iPad. 🍏

Tech-Spec

Audio

Chief bracket for sound shower

Extron MIX 301 mixer

Fohhn LX-10 ASX loudspeakers, AS-06 ASX subwoofers and AM-50 master module

QSC PLD 4.2 amplifiers

Sennheiser HD 201 headphones

Sonus Audio Focus Q sound shower

Yamaha MRX-7D processor

Video

Barco Clickshare

Chief display and projector mounts

Datapath FX4/H videowall controller

Epson EB-G7905U projectors

Extron DTP transmitters and receivers, HDMI amp and switcher

HTC Vive VR goggles

I-Beam VT 200 bass shakers

Iiyama TF2234MCX displays

Lightware TPS-TX95 transmitters and TPS-RX95 receivers

Microsoft HoloLens glasses

NEC X554UN-2 displays

Picturall Quadro Mark 2 + media servers

Samsung Gear VR system and QM85D LED

Control

Apple iPad

Crestron control system