



IT & Technology



**2bm partner with Arm to provides a high efficiency, high density data centre and push forward their data centre strategy**



*We had an immediate need for a high efficiency, high density data centre in Austin, Texas. But more importantly, we have a long-term need for a partner who can potentially help us without go forward data centre strategy*



**John Goodenough**  
**Vice President of Design Technology and Automation at Arm Holdings**



# MINIMISING ENVIRONMENTAL IMPACT WITH AWARD-WINNING DATA CENTRE IN NORTH AMERICA

## The client

FTSE 100 company Arm Holdings is at the heart of the world's most advanced digital products. As the leading semiconductor IP supplier, Arm is responsible for the design and creation of smart, energy efficient semiconductor chips that are used in iPhones, virtually all other smartphones and all types of applications. Headquartered in Cambridge, Arm has data centres around the world including Taiwan, France, India, Sweden and the US.

# enabled, efficient, ready.



## Project Overview

Arm required an HPC data centre in North America. The task was to deliver multiple, innovative, energy saving features within a single facility, in a US State with challenging environmental conditions and a severe water shortage.

The dedicated data centre needed to be low energy and sustainable following Arm's template for worldwide data centre deployments and corporate responsibility.

The facility was to be built on the success of 2bm's CEEDA Gold Certified and multi-award winning design for Arm's Cambridge data centre in the UK.

## Challenges Faced

Arm already had a major office and engineering presence within Austin TX, so the ability to establish a high-efficiency and fully customised facility in this key location was critical.

As Arm continues to expand and gain market share, the company understands that in order to meet the increased customer demand a comprehensive and easily scalable data centre strategy was needed.

One concern was the climate conditions in Austin, as the data centre needed to be a low energy and sustainable data centre. Resource use had to be minimised wherever possible and the facility needed to achieve virtually zero water consumption to prove environmentally viable.

2bm had not worked in the US before; as a result Arm and 2bm partnered with Digital Realty Trust (DLR) to provide the building structure and US based project lead. Full integration of the Arm, 2bm and DLR project teams was to be of paramount importance.

The delivery schedule for the facility was extremely short which was accentuated by the complex engineering which had to be adapted to meet Arm's objectives.

## The Solution

All three firms worked together to deliver the features selected by 2bm to save time, labour and eliminate material

waste. 2bm also directly engaged its US engineering partner PAE to assist with its MEP design, ensure compliance with local codes and fast track the approval process.

DLR had an existing structure available in Austin which was used to minimise waste in construction materials. 2bm relocated part of its design and project management team to the US to minimise air travel. Further, the 2bm design called for materials and plant to be sourced locally within the US where possible.

The facility's energy use was fully optimised with virtually zero water consumption. High density, water cooled IT enclosures were deployed using unusually high supply water temperatures. For all hours that outside conditions allow, the cooling system operates using an innovative multi-stage dry cooler; this system was specifically developed for the project.

At all other times the systems use mixed mode free cooling, or super high efficiency air cooled chillers. All compressors, pumps and fans used within the design are speed controlled which further contributes towards the most efficient operation in all conditions.

A low loss UPS system by Austin based Active Power was specified by 2bm which incorporates a rotary flywheel battery storage and GenStart systems which negated the need for lead acid batteries on the project. This UPS is 98% efficient at 75% load and with no requirement for lead acid batteries natural resource, transportation, future battery renewal and recycling are eliminated.

Full energy monitoring and fault alerting functions are available to Arm using Sensorium AMT. This is the same DCiM platform as used in the Cambridge facility. Sensorium AMT allows Arm to fully monitor and manage its data centres worldwide.

**The design of the Arm NAHPC data centre fully embraces and surpasses the sustainability credentials and the requirements of the EU code of conduct for data centres and is arguably the most efficient HPC facility in Texas.**

This state of the art data centre was recognised at the **Datacenter Dynamics North American Awards 2014**, being a finalist in 3 categories, 'Green Data Centre' of the year, 'Innovation within a Medium Data Centre' and 'Special Assignment Team' of the year and was

a proud winner of the first two categories. In addition the facility is the world's first data centre recognised by CEEDA for accreditation as 'Design and Build, Construct and Operate' from concept to reality.



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