

Notes on VC presentation made to CAETS Council meeting (Held in Brisbane, Australia) from AI Working Group on 9th September 2025.

Prepared by: Tom Leahy – Special Advisor, Director and Past President of the Irish Academy of Engineering.

Quick recap

- Presentation made by Professor Barry O’Sullivan FIAE– chair of the CAETS AI working group, including draft slides prepared by Tom Leahy Special Advisor/Director & Past President of the Irish Academy of Engineering.
- The presentation slides are included on a separate power point file.
- Both Barry and Tom attended the CAETS Council meeting by VC for the presentation.

Barry provided an overview of the AI working group's activities, highlighting energy consumption concerns, misconceptions about artificial general intelligence, and historical connections to key figures in AI development. The presentation ended with updates on a collaborative project to prepare a white paper focused on AI and engineering, including discussions on economic impacts and the upcoming release of a white paper in Q4 2025 with recommendations for AI implementation.

Next steps

- Working Group to finalize and circulate the draft “AI and Engineering” white paper by the end of September 2025 or latest by the end of October 2025 for comment.
- Tom Leahy to assist with finalizing the white paper document for publication on the CAETS website.
- Working Group to determine next steps after the white paper publication, including new chair/working group and potential response-based or subcommittee approaches.

Presentation Summary



CAETS Working Group(WG) on Artificial Intelligence(AI)

Report to CAETS Council meeting September 2025

by

WG Chair – Professor Barry O’Sullivan

Date: 09 September 2025



WG chair Barry O'Sullivan

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Great progress was made in the early decade of the 2,000's and from 2010 onwards on a technique called "deep learning" which won the ACM Turing Award in 2018 and the key innovators behind that were LeCun, Hinton and Bengio.



There is no intelligence in large language models – they can produce text but they don't understand anything of what they are saying.

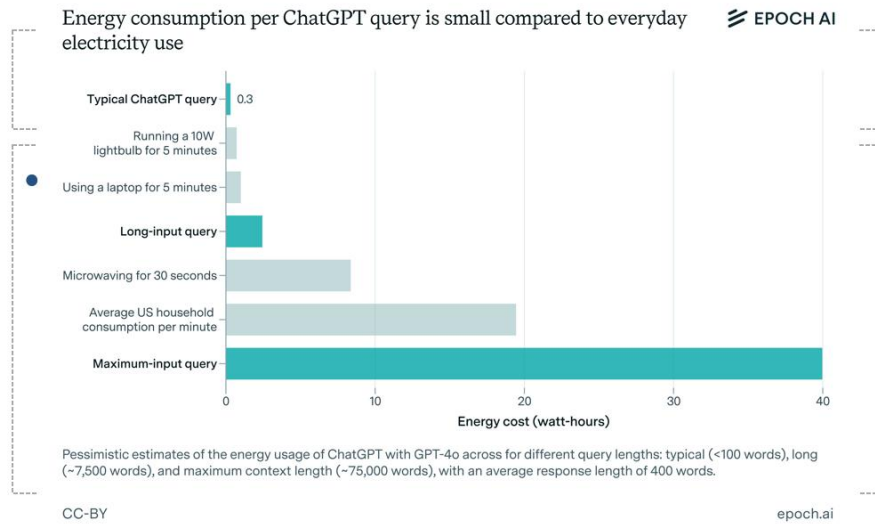
AI Energy Consumption and Myths

Barry, a professor at University College Cork and visiting professor at Northwestern in Chicago, runs the Irish National PhD programme for AI with funding for 120 PhD students, reported on the activities of the AI working group.

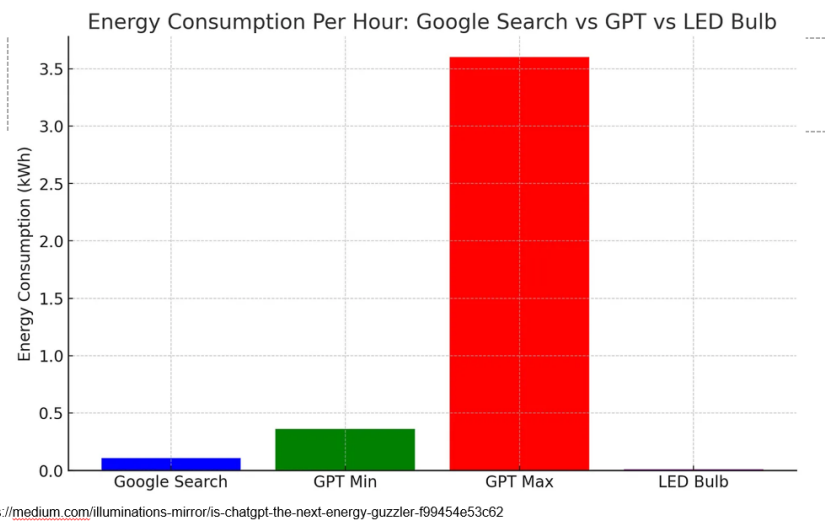
He highlighted the energy consumption and carbon footprint of AI systems, emphasizing that each query consumes as much power as running a laptop for four minutes.

Cost of energy consumed by large language models is quite significant.

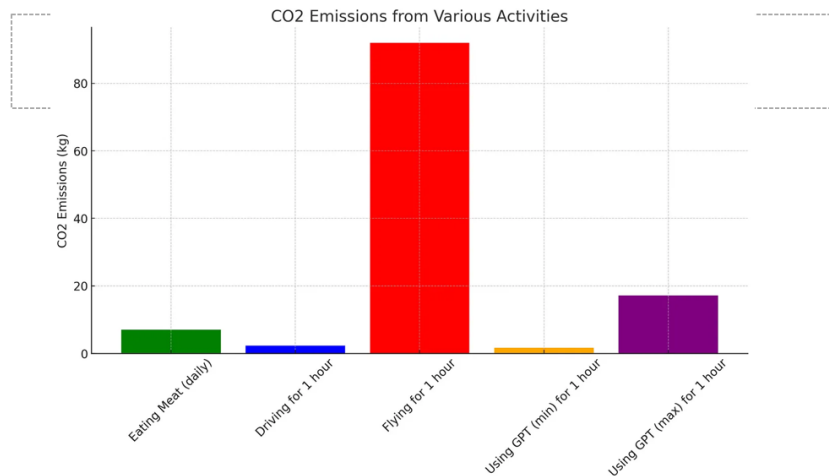
Each query executed consumes nearly as much power as running a laptop for 4 minutes.



The carbon footprint is even more dramatic-energy consumption is more than the average google search



Carbon is even more interesting -running a chat GPT query is associated with as much carbon as driving for about an hour.



<https://medium.com/illuminations-mirror/is-chatgpt-the-next-energy-guzzler-f99454e53c62>

Barry also discussed the misconceptions surrounding artificial general intelligence (AGI), clarifying that the current definition is financially driven and not based on actual AI capabilities.


INNOVATION > AI

DeepL CEO Challenges Microsoft And OpenAI's \$100 Billion AGI Definition

By [Charles Towers-Clark](#), Contributor. © Charles Towers-Clark writes about h... [Follow Author](#)

Published Feb 21, 2025 at 03:53am EST. Updated Feb 21, 2025 at 12:32pm EST

Microsoft and OpenAI recently sparked controversy by defining artificial general intelligence not through technical achievement, but through profit — specifically, \$100 billion in annual earnings. This benchmark appears in their partnership agreement, essentially allowing Microsoft to retain access to OpenAI's innovations until this financial goal is met, likely well into 2029.



Forbes

Barry discussed Artificial General Intelligence(AGI) – there is a financial definition written into an agreement between Microsoft and OpenAI – If OpenAI can create a focussed business that generates \$100Bn./year in profit that will be regarded as meeting the definition for AGI.

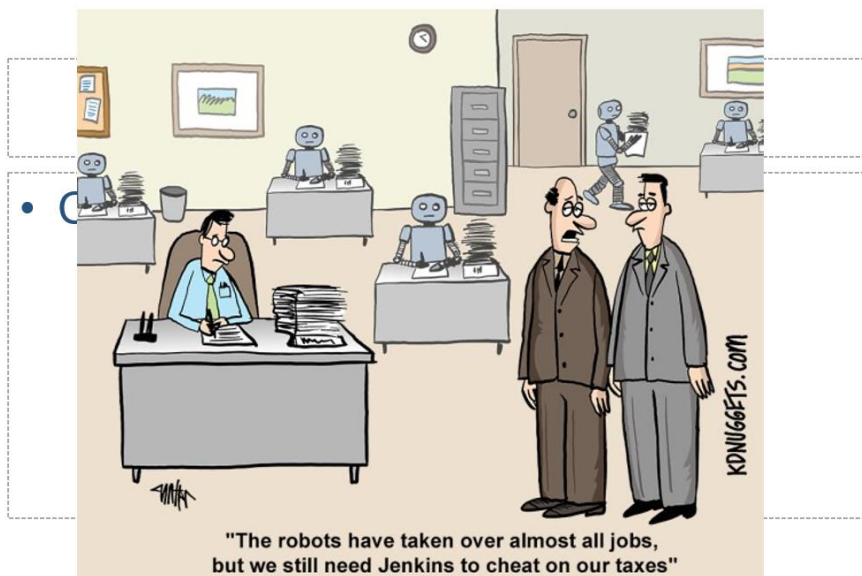
A.I. Poses 'Risk of Extinction,' Industry Leaders Warn

Leaders from OpenAI, Google DeepMind, Anthropic and other A.I. labs warn that future systems could be as deadly as pandemics and nuclear weapons.

The New York Times



He advised against being overly excited about AGI and dismissed the existential threat and unemployment narratives often associated with AI advancements.



Irish AI Pioneers: Historical Connections

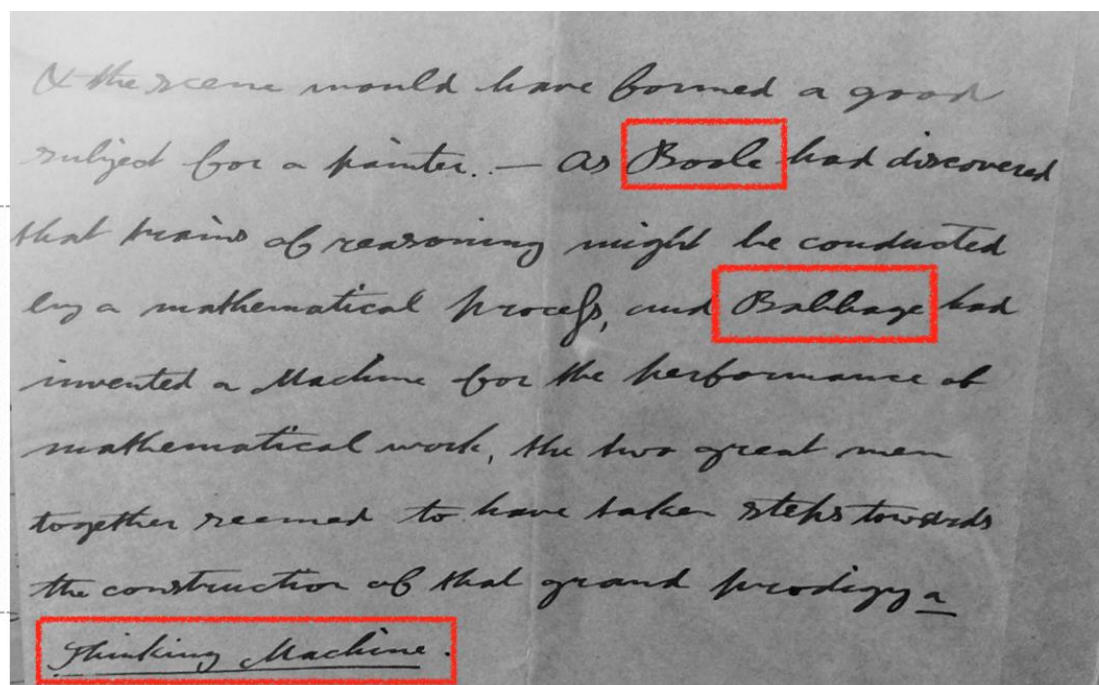
Barry discussed the historical connections between Ireland and key figures in the development of artificial intelligence, including George Boole (The father of Boolean Algebra -The first Professor of Mathematics in UCC – Cork University where Barry is Professor), Alan Turing (Englishman whose mother was Irish), John McCarthy (The person who named the field of AI was a first generation Irish emigrant from County Kerry) , and Geoffrey Hinton(He is not Irish but is the great, great grandson of George Boole).

He highlighted that these figures, despite not being Irish themselves, had significant Irish heritage, with some being related to Boole.



Barry also mentioned a historical meeting between Charles Babbage and George Boole in 1851, where they discussed the concept of a thinking machine, which laid the groundwork for the development of artificial intelligence.

This letter was written to George Boole's widow after he died in the 1850's and records a meeting between Charles Babbage and George Boole, where they actually considered the notion of a thinking machine -Boole essentially had the software and Babbage had the hardware (Difference engine) and they thought that together they could automate human thinking. This meeting took place in 1851!



He noted that the term "artificial intelligence" was coined in 1955 by John McCarthy and others, marking the 70th anniversary of its creation (August 2025). They thought in 1955 this was an activity that this could be a summer project funded by an agency of the USA.

AI is with us today at the CAETS meeting – Zoom relies heavily on AI and the video conferencing we use is heavily reliant on AI. Each member of CAETS Council has probably intersected with at least 11 AI systems today already.

AI Engineering Collaboration Progress Update

Barry discussed the progress and challenges of the collaborative project focused on AI and engineering. He explained that the group, established in May 2024, aims to produce a white paper by the end of October 2025, covering topics such as AI's impact on engineering practices, education, and system design.



Creation of CAETS AI Working Group

May 2024 – VC Meeting to agree logistics

- Ruth David –CAETS Secretary/Treasurer
- Barry O'Sullivan – WG Chair
- Tom Leahy – IAE Director/Past President

June 2024 – Inception meeting of WG

Agreed schedule of WG meetings – monthly from 13.00-14.30 (GMT) on the third Tuesday of every month.

Initial expressions of interest – 45 CAETS Academy members.

Document sharing - using google docs.

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CAETS AI Working Group Challenges



- Topic is of great international interest
- Advancing very quickly – Any report drafted by CAETS likely to be overtaken by events before publication.
- Lack of administrative support from CAETS
- Meeting times over different time zones
- Over a calendar year the initial interest from 45 CAETS members dwindled to about a dozen active WG members

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Barry highlighted the slow progress due to a lack of administrative support and the difficulty of coordinating meetings across different time zones. He also emphasized the need to balance discussions on general AI concepts with a focus on broader AI applications beyond generative AI.

AI's Economic Impact and Challenges

Barry gave an overview of the planned CAETS AI Working group white paper- **Overview of AI and Engineering (Engineering the Age of AI)**



Engineering the Age of AI	
1	Overview, Purpose and Audience (audience being CAETS and external)
2	Overview of AI (including GenAI appropriately, pointing to interesting resources, include standards, ethics and legal/regulatory matters also)
Part 1- Engineering with and for AI	
3	AI for Engineering (and Scientific) Practice
4	Education: AI and Engineering
5	Engineering for AI Systems
6	Economy and Future of Work (careful not to overly focus on GenAI)




Part 2 - AI for Good	
7	AI and Sustainability
8	Equality, Diversity and Inclusion
Part 3 - Enabling Progress	
9	AI and International Cooperation (intellectual property issues, export controls)
10	Investment in AI and Adoption (examples from the major international geographies)
11	Recommendations and Conclusions
Appendix	Relevant reading and information

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Report will be a snapshot in time and we hope to future proof by giving recommendations on a variety of topics as they relate to Engineering. Plan is to circulate a draft paper for comment in October (TBC) . This will be an outward facing report.

Next steps by CAETS

- Contributions for some but not all individual report chapters have been promised and are in preparation.
- It is planned to complete this phase with an interim summary in Q4 2025 of all contributions received.

Going beyond this requires:

- A new WG/Chair and relevant contributions from CAETS Academies & subject matter experts
- Support by an administrative team
- Building on the foundations achieved by this WG
- Recognising the very rapid deployment of AI

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Barry presented a comprehensive overview of AI's impact on the economy, focusing on automation's role in creating income inequality and its implications for global political turmoil. He highlighted the importance of AI sustainability, equality, and international collaboration, noting that only a small percentage of SMEs (less than 10%) are actively using AI.

Barry announced the upcoming release of a white paper in the next quarter, which will include recommendations and relevant reading materials, and discussed the possibility of the working group addressing specific AI topics on an as-needed basis. This will be a final task for Barry. The next follow up will be a matter for CAETS to consider.

In conclusion Barry thanked the members of the working group for their active participation, Tom Leahy for his active assistance and said the White Paper should be a document which CAETS will be proud to put on their website and should reflect well on the contribution to an active debate on AI and Engineering.

CAETS Council thanked Barry, Tom and all associated with the Working Group.



I want to thank all the WG members who have remained active and enthusiastic and thank CAETS for the opportunity to contribute to a very active debate on AI,

CAETS AI WG chair Barry O'Sullivan

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The CAETS Council meeting in Brisbane then concluded.