ChemEng Evolution Transcript Summary
Andrew Liveris talks to Past President, John McGagh

Andrew N. Liveris is a former CEO and chairman of The Dow Chemical Company of Midland, Michigan. Liveris has been a member of Dow's board of directors since February 2004, CEO since November 2004 and was elected as chair of the board effective 1 April 2006. Liveris became CEO in 2004 after holding the position of chief operating officer (COO). Afterwards he served as executive chair of DowDuPont, where he remains a director. He is chair of the board of Lucid Motors.

Liveris serves on the board of directors of the battery company Novonix, and he is also on the board of IBM, Saudi Aramco, Worley, Lucid Motors (Chairman) and He is on the advisory board of Sumitomo Mitsui Banking Corporation, Teneo (a global CEO consulting and advisory firm), and NEOM (an initiative driven by Saudi Vision 2030). He is Chairman of the BlackRock Long Term Capital and a special advisor to the Public Investment Fund (PIF) and the Crown Prince of Saudi Arabia and a member of the executive committee of the Business Roundtable. Liveris is also a former president of the International Council of Chemical Associations. He served as vice-chairman of The Business Council for 2011 and 2012, and as chairman for 2013 and 2014. He is a member of the Peterson Institute for International Economics, and the American Australian Association. Liveris is on the board of trustees for the United States Council for International Business and is a trustee of the California Institute of Technology. Liveris is a member of the Business Advisory Board for the University of Technology Sydney (UTS) Business School. In April 2012 he became a member of the Special Olympics International board of directors.

In 2011 Andrew Liveris was awarded the George E. Davis Medal, Institution of Chemical Engineers (IChemE).

Transcript note.

This was a very expansive interview and the below has been chosen to tease out editor identified key themes.

Key messages/themes distilled from narrative.

Resilience and Blueprints.

- I believe the interesting dynamics (of change) lie at the intersection of business, government and society and I am playing at every point in that triangle to try and get impact and influence in the trends that are very much upon us.

- The issue that was not being talked about much is now being starting to be talked about a great deal is that Chemical Engineers will have an important role to play in and that is the issue of (planet) resilience.

- This planet is not resilient.; climate-change is not the only topic we must consider; it is how we achieve system-wide resilience.

- The resiliency of all-natural systems is being stressed and stretched to the point of failure (by human activity) and that is impacting every aspect of the environment, not just climate.

- We must think resilience and teach about how to build resilient systems; we must understand how those resilience systems can be put in place.

- The concept is the circular economy, I do mean the affordability of making sure that we do no more harm to the planet at all (whilst delivering equity to the global population).

- It is becoming increasingly self-evident that that we must in fact stop deforestation, stop contamination of waterways and now we have an emerging vision of zero-carbon technological pathways.

- In the 1980's and 19990's we saw promising speeches thinking about the **footprint** of humanity on the planet.

- In the early 2000's the discussion morphed into the **handprint** of humanity on the planet.

- The difference between footprint and handprint, is footprint was a mindset around structures, handprint was a mindset about us.

- The notion that is appearing now is a **blueprint** for our (humanity) interaction with the planet.

- The planet (and possibly the planets') we will populate by 2100 must be based upon a blueprint of resiliency.

Genius v/s Incumbent Political Systems – Precondition for Change

- The previous (historical) class of institutions that were created essentially in the last two centuries and they are clearly not capable of taking us to the places we need to reach given the systemic challenges humankind is facing on this planet as we strive for resiliency.

- Big challenges humanity faces as we move to 2100 and the solution set changes required to address them are probably going to be catalysed, in part, from what I can see is as emergence of true genius.

- There are some quite visible examples of this already, for example an Elon Musk or a Steve Jobs or Ray Kurzweil, Dean Kamen, Brian Greene, Stephen Hawking? We can go on. In history we see genius appear to help guide us and stretch us to places that we would not have reached without them.

- There are historical lesions, Isaac Newton, Albert Einstein, Mozart etc. stretched humanity to be greater than it could have been under a static political class.

- The resiliency challenges are literally leading to a youth rebellion as they express their dissatisfaction in the ruling institutions, in some areas this is leading towards anarchy and this is delivers first precondition to change, which is the rise of division.

- There are several tectonic shifts, for example our "lurch" to Globalization 2.0 given the failure of Globalization 1.0 which left too many people behind.

- We must think deeply about what globalization 2.0 really looks like in terms of the forces of going smaller (smaller connected society nodes) before we go bigger; effectively we are seeing the growth of societal clusters and the pandemic has forced this upon us, leading in some important ways to the rediscovery of community and the rediscovery of family.

- Many dominant forces have shaped the incumbent socio-political systems, finance, legal, capitalist-political, and most recently digitally enabled social systems (which violate citizen privacy provisions).

These models are all challenged by the concept of resiliency so they will become less influential and possibly eventually disappear as we move towards 2100.

Possible Models - Inclusive Capitalism, Quality of Life, and AI

- The planet we populate by 2100 must embed the concept of resiliency, without this 11B people will face significant/insurmountable problems.

- To achieve a state of resiliency we probably need to develop towards what I call an inclusive capital approach.

- Essentially capital must flow to create a truly inclusive society and scientists (plus engineers) lie at the heart of the inclusivity debate, this means that scientists need to speak policy as comfortably as they speak about science.

- We will have some new tools to help us. This starts when the machines do, in fact, become cognitive and lead us to this new level of insights that AI promises, which is new machine insights to augment human thinking.

- The class of society that practices inclusive capitalism should be firmly in place by 2100, it is in fact taking machine insights and human insights and solving the intractable problems of resilience under the notion that we can no longer take advantage of (exploit without consequences) the resources on this planet alone.

- We must value nature and by putting a price on nature and by doing it in that way we can expand nature on this planet so that the growth from 7 to 9 to 11 billion is manageable.

- By 2100 I expect we will have figured this out using machine-based AI and the merging of machine and human would probably be well in place.

- The goal is to allow all eleven billion people to have one quality of life, the highest quality of life a resilient planet can provide.

- If we are not prepared to embrace this resilient future right now the tectonic downside could lead in fact to a World War, I cover this later.

- The youth of the world are insisting and asking us to solve these problems.

- Chemical engineers and scientists should start to rejoice over the emergence of this future.

Tectonic Downside? Potential for East v/s West Conflict

- Multiculturalism is a Western phenomenon, not an Eastern phenomenon.

- China is providing the world an alternative model. If you go back in history, China was an ascendant nation four hundred years ago that was putting its footprint on all its neighbours.

- Eastern philosophy embeds homogeneity in culture; in fact, Japan's a great practitioner of this as are most of the Asian races and in particular China.

- Now this possible "war" will be driven by the two opposing views of homogeny of culture v/s diversity and multiculturalism. This concept of World-War will be carried out technologically, not necessarily, through foot soldiers on the ground.

- In fact, we are at the very early stages of this now we are observing cyber theft and hacking, election interference, a loss of privacy and loss of data all under the new term called cyber-war; this how the new war will play out.

- If you see our future being shaped by an internet based digital economy, it is worth noting that China has already separated from the wider digital economy by implementing an internal internet (including some neighbouring countries). This is less world centric than the competing internet which is essentially based on the US model. Two models have emerged.

- And when will the line in the sand be drawn? I believe that the line in the sand will occur in the next 10 to 15 years.

- This is important because all of humanity needs to be striving towards a resiliency blueprint for the planet.

Building resilience at the intersection – a different call for education

- The interesting dynamics (of change) lie at the intersection of business, government and society and I am playing at every point in that triangle to try and generate impact and influence in the trends that are very much upon us.

- Change does sit well across the left v/s right dividing political line, inclusiveness from a government policy point of view does not tend to get you votes, division gets you votes.

- Think of the politics of a certain class of politician holding up a lump of coal saying vote for me because I am going to support your job because it in coal.

- You then hold up an environmental policy platform and say vote for me and I am going to get rid of coal. The coal people will not vote for you, the environmental people will. This is the policy of division not resilience – against the actual resilience need to reduce emissions.

- However, the inclusiveness intersection of business, government and society would say that I am going to provide a new type of job. I am going to train you for that job. I am going to let you know how that job occurs, and oh, it moves from here to here in this time frame. And I am going to look after you, not as a nanny state, but I am going to invest capital in your future as it helps us build resilience.

- This is the debate that will shape public opinion but where do you generate it from because you are not getting it from the media anymore, the media is lost in their own division-driven debate. In terms of reporting facts, you know you do not get it from the media.

- So, my conclusion is that most people do not get needed facts (from media) they get divisive opinion.

- Where can wider society access inclusive information to help build resilience? Perhaps society can best access this through the reimagining of the role of universities.

- Universities can be the providers of these important facts feeding into context that ultimately feeds into policy in a manner that everyone can access (as opposed to representing an ivory tower elite).

- Universities must become a place designed for all citizens. I do not mean just all online learning, but this could also be included, rather, I mean, bringing together communities of interest in subjects spanning society, politics and technology leading us towards resilience.

- We do need to rethink access to universities and length of degrees, the 4-year degree is outdated, and it is too long. Modern technologies and teaching methods can shrink this time.

- We must mix educated people, academics, and bus-ness people to actually talk about matters contributing to resilience.

- A type of politician needs to emerge form of education process that actually knows the facts and can translate into policy that builds resilience.

- Under this model everyone has a mandate to run for political office.

- I believe Global problems can get solved by people at an age of 20 through 30 (so let us enable them).

- Chemical Engineers are trained not only to identify problems but are trained to provide solutions, this should be an incredibly exciting time for them.

- Resilience solutions lie at the intersection of politics, policy, and society. If we do not get anything else right in this century, we have got to get this right.