Journal

1. 1989 - 2013. I establish a water conservation products manufacturing business, initially making primary sensor, analogue electronic water control devices. Through an organic business growth process, beginning with rudimentary studies in the built environment, my interests and knowledge grow. I design bespoke water control solutions for industrial and process water conservation applications, finding a market and applications with multinational consumers. I learn how to make scale models for individual production processes. I master coding for microprocessor based solutions, manufacturing simple robotics, adiabatic changes in water use, water recycling and mechanical design improvements for industrial production processes. Sometimes the water savings are remarkable, I prove that I have been able to reduce water consumption by 50% for food production plants. The importance of the work inspires me to continue.

Later I secure contracts and the investment to implement water conservation projects for large scale, commercial property landlord estates, identifying a combination of applications across the built environment and commercial food production. I design a new factory, production lines and a training centre. I learn to manage a field operations workforce, in house designing and coding amongst the first touch screen interfaces, (ERP). I win a national supplier award for the water savings achieved. My reward is an investment to build a new research facility to spend on what I want. By this stage in my life, thousands of water process usage studies take place, implementing programmes of work and measuring savings for around 12K metered supplies, encompassing the built environment, production systems solutions, research, testing and training innovations.

I reach a crossroads about what to do concerning the new investment, and I begin to think about an exit strategy. I conclude at this time, water conservation is difficult to continue in the long term, it is entirely voluntary. I find consumers are more often unwilling to invest the millions in conservation research and efficiency improvements programmes. I conclude there have always been more reasons for inaction and the devil's advocate always wins. I develop new smart metering technology, invest in recruitment, software engineering, I use knowledge transfer programmes and technology manufacturing grants. The business is bought by an energy PLC.

2. 2014. I have some time on my hands. I write 3 volumes of water savings case study books, covering the many conservation topics I have encountered over the years. It is a hobby to categorise and document every case study from memory and closure. I store the books in a cupboard.

3. 2016. Two of my former engineers, inventing from their home workshops, build a little camera sensor array (prototype), which will photograph water meter registers - a novel, automated meter reading (AMR) solution. They contact me to ask if I can help - I am intrigued. I write a business plan for them, arrange patents, attract investors, and secure starter projects with water companies in the UK. I research around 150 water companies, water retailers, commercial energy and water advisors, making contact with those service providers in the UK to gauge interest in the new technology in this period. I evaluate interest and the potential for sales applying four basic tests:

1. Turnover relevant to water conservation activities.
2. Evidence of facilities, (factory space as opposed to only offices).

3. The number of commercial vehicles in the fleets.
4. Water conservation methods, diversity of water savings and published case studies.

I advise investors that a water conservation industry does not exist in the UK at scale. Notwithstanding the trials agreed, it is felt, direction for the new technology is best placed aimed at reading water meters that aren't presently collected, offsetting fines levied for under recording performance. In light of my findings, evaluation of future product development investment and financial risks, investors decide upon a route of exclusivity for the new technology.

4. 2017. For the first time in the country, a national database is constructed containing the water meter readings and volumetric water consumption for industrial consumers. I gain early access to this data and see that industrial water use is increasing, and 125K public use buildings overall, show no improvements in reductions in water use over the previous 6 years. I read national plans for the construction of hundreds of thousands of new homes. I begin to wonder at what point in time, water supplies will become unsustainable in the future. I want to see this used as an interactive display and the first simulated national grid for water in the country.

5. 2018. Water companies begin trials installing the camera sensors. Public use buildings have been selected across the regions.

6. 2019. The project is extended to Yorkshire, via a route through the Yorkshire Purchasing Organisation (YPO). I am invited to the London Energy Project, (LEP), this time including hospitals.

I follow my hunch that very little has been done to reduce water consumption. I am granted access to inspect buildings to complete process usage studies - the camera sensors prove useful to press consumers to carry out inspections. I do this unassisted, I purchase a large van, and pack it with plant and equipment - the work consumes almost a year of my life. The biggest task I encounter is in reconstructing deep study audit and water measurement books. I reach version 30 development of workbooks and formulas, by the start of the pandemic. I see more will be needed to complete 5 management reporting templates (programme management methods), I envisage should be completed to demonstrate detailed reporting on water conservation savings across the built environment - the proof that conservation work has actually been done and the measurements of the savings recorded.

I encourage public estate officers to attend field conservation studies. I note transformative improvements are possible for each and every building surveyed, forecasting significant water savings - ridiculously large savings in some cases. I encounter water wastage for new energy efficient, Breeam certified locations. I observe increased use of third party contracted services, the transference of basic repairs and renewals functions, via the proliferation of online tendered contracts and the use of third party procurements service providers. I note the turnover in sub-contracted staff. I witness large scale use of online water reporting software, yet no asset management consolidation techniques or improvements, in some cases over many years. Officer's inform me about the difficulties engaging peers in field studies - preferring office based duties. Others describe dissatisfaction in assigned roles and functions. A number of others share their dissatisfaction with the quality of reporting outputs received when offered water company incentives to participate in conservation schemes. I already know this work is entirely sub-contracted. A considerable number of officers describe

water as a forgotten utility, because it affords very low carbon reductions, and isn't therefore an intermediate priority for public investment. I conclude there appears generally, low morale, the tendering process doesn't work, and water conservation is going to need massive investment, just to get those buildings to tier 2 level savings, before more advanced solutions might need to be considered. The Water Conservators Organisation objectives are not met, *"To promote the development and advancement of the science, art and practice of water conservation".* In this statement, I recognise the endeavour, commitment and passion needed to do this work.

7. 2020. I listen to Dr. Mark Carney's Christmas lectures on subjects of transition to Net Zero, his vision to unlock trillions in stock market investments, a future 'age of nature,' and the challenges governments will face in maintaining investment commitments to citizen's social contracts in addition to net zero investment. He concludes the lectures with a challenge to state policy holders, to apply measurable, economic value to all human life.

Inspired by this message, I read Parliamentary Scrutiny Committee findings on the £12 billion invested by the Central Government via Local Enterprise Partnerships,(2019). The Committee concludes it has no evidence for any new jobs that wouldn't have been created anyway. I question if large scale, public investment in jobs creation or energy savings initiatives is sustainable. I start work on the feasibility research for a new national water conservation industry, drawing upon my own practical experience and what it might be like to see water conservation tackled at scale. I think about calculating national water conservation savings, establishing technical centres of excellence and future construction of an industrial water conservation business plan.

8. 2020. "Build Back Better". I test ideas, promoting the concept for a national social employment enterprise. I conduct team workshops for LGA's, a few political party conferences and housing associations, describing job creation opportunities, skills funding, exploiting water conservation, that might offer practical employment solutions. At this time, I envisage an uncertain future for the national minimum wage, the results of low national productivity on income, job security, and millions of people struggling in arrears for council tax and rent.

I make contact with an old customer, meeting the director of global commercial property investments for one of the largest pensions and insurance providers in the world. I don't know a lot about corporate investment funds and how they work - I ask questions. He proves helpful and largely supportive. The suggestion is offered that an investment fund could be created specifically for water conservation, aimed at an emerging water offsetting market sector in response to future water shortages. I am introduced to the concept of water neutrality zones and the differences between offsetting and neutrality. I learn that City investment funding, through pensions, are being used for the purchase of land and the construction of new housing. Introductions are offered to speak with housing property developers, to explore the feasibility for conservation savings in the built environment, to find out if there is any perceived value.

9. 2021. I have never thought about water offsetting, utilising the existing built environment before. I am able to present estimates and calculations to property development consultants, debiting the credit and crediting the debit, offering a basic overview. I prepare an illustration,

amortising water savings, assuming the most recent public use buildings conservation research I have available, is accurate and indicative for conservation results on a larger scale. I compare house building construction forecasts, using numbers from a local authority regional example until 2050. I deduct one from the other. The prediction suggests sufficient water savings may be offset, against equivalent annual water consumption for every new home built, for the next 25 years, equivalent to the construction of around 18K new homes in the area.

The local authority illustration is developed to show how their water bills could be capped for 10 years, absorbing water company tariff increases and the mitigation of the effect of compound interest, year on year on water bills. An investment of £15 million in transformative water conservation measures is included, costing for the installation of new equipment, repairs and renewals, with installation of automated meter readings (AMR), automated billing, water savings tracking, and exception alerts, (the public sector has wanted this for the past 30 years). I am surprised, taking those costs into account, on paper at any rate, water conservation might be able to offer reasonable returns, satisfying the criteria for a potential, new city investment fund.

10. 2022. I am invited to participate at an internal conference by the global innovations director for a long established detergents and chemicals manufacturer. The meeting takes place over 2 days at one of their technical centres based in Europe, around 350 engineers are in attendance. I am shown around the research facility, which consists of a series of food production simulations and laboratories, containing all of the major industrial dishwashers, (warewash), glass cleaning, refrigeration and washing machine production machinery. The company describes how they are tasked by major food brands to demonstrate reductions in water consumption and the use of detergents and chemicals. Machinery is remotely monitored, along with automated dosing systems, using wireless LAN and WAN technology. I am permitted a slot at conference to share the vision for the largest social enterprise in western Europe in the pursuit of industrial water conservation. I share examples from the old case studies books. Delegates ask me a lot of questions, they also share ideas, recognising ancillary areas for water conservation in utensils servicing and preparation, hygiene processes and production conveyance. I seek to test the viability and the value to a major industrial service provider, that future water conservation technical centres of excellence could bring. The innovations director announces the inclusion of 50 factories in a future programme, instructing delegates to find sites in readiness.

11. 2022. The remarkable innovators in the built environment. Toilets consuming 1.5 litres per cycle, washroom taps 1.2 litres per minute, showers recycling 80% of the water and reclaiming 75% energy. Those inventors rarely if ever get an opportunity to be considered at the design stage for new buildings, and I want to find out why. This is an extensive piece of research, best illustrated under separate cover. In conclusion, for the reasons that the camera sensor technology inventors could not penetrate a water conservation marketplace, the same issues apply to all future innovators in the built environment - they need a technical centre of excellence. We must move away from water company concentric initiatives, because inventors are stifled.

12. April - May 2023. I make contact with the previous 75 public sector organisations I engaged originally, those who participated in the technology trials and conservation studies

(2019). I widen communications within these organisations to include; sustainability officers, energy officers, strategic asset officers, climate change officers, community leaders, and executives, to assess if attitudes towards prioritising water conservation have changed as a result of increased energy utilities costs, or environmental sustainability pressure.

Response examples:

Matthew,

Water has been a 'Cinderella' utility in both our understanding of it and that is a small portion of our spend.

University Bristol

Hi Matthew – thanks for this information, really interesting.

We are currently recruiting 2 new Energy Officers, we don't have the internal capacity to give this the attention it deserves right now.

University Leeds

13. June - July 2023. I lobby the Place Based Climate Action Network (PCAN), describing the need for a mandate for water conservation, proposing The National Industrial Water Conservation Target. I explore how organisations themselves make up a large percentage of the very wealthy that can simply afford to pay for water which for them, is an inexpensive resource to consume. I note that the Climate Committee has no significant, regional or national water conservation case studies.

14. I conclude my water conservation research, drafting and circulating an email, listing the 12 actions I consider are urgently needed to begin the task of reducing national water use, and how we can exploit this to create the largest social enterprise in Europe.

15. August 2023. I am contacted by the Net Zero Programme team for the North East. The University of Durham, expresses interest in the value of water conservation and the social impact for new employment.

16. Sept 2023. I submit a response to Professor Lorraine Whitmarsh, Director for the Centre for Climate and Social Transformation, (Cast), following the commissioning of her paper by the Climate Panel: The Implications of Behavioural Science for Effective Climate Policy. I write describing the reasons why I must disagree with the basic direction of this paper.

My Response Extract:

"I congratulate you on your academic efforts to bring together the best in thinking and practice in the studies of humanities and Climate Emergency. However I disagree with the basic direction of the paper.

I discover greenwashing is deeply ingrained in society, across senior management, civil servants, public agencies and industrialists, encompassing all sectors and developed over

such a very long period of time, it's going to be hard for people to change direction. I find in their behaviour and lack of understanding and actions, that water conservation is always someone else's problem to fix.

Until such time as the Climate Committee and government comprehends the scale of the challenge and applies measurable, economic value for human life, no significant behavioural changes will take place. Millions of people will never regard a future age of nature as theirs to own. Water conservation offers a beacon of hope for change and should have been included in your report."

I read that Ofwat has announced a very large, new water conservation fund, for the first time, seeking wider consultation for new ideas. I receive acknowledgement from the regulator and I share this information with the University of Durham, who are leading a new NorthEast Universities' consortium called 'In-TUNE'. I make contact with the NGo Waterwise, to find out if they might be willing to support, develop and steer the social employment initiative, through collaboration with a future north east academic hub.

18. October 2023. I research poverty action and wildlife/conservation charities, listing and sharing ideas for collaboration on jobs creation for social employment:

- If a poverty action charity would be willing to participate, adding knowledge based insight and value at an early stage in the development of an academic business plan, this might add weight for the inclusion of social employment as the project's first priority.
- It might be possible to obtain funding for the poverty action charity, if they wished to get involved with this project and for those who might be interested in working alongside the stakeholders.
- There may also be existing social enterprises, who could be interested in exploring actually carrying out work programmes, research and roll-outs in the future.