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# TRANSITION FRAMEWORK

TOWARDS FUTURE PRACTICES  
OF SUSTAINABLE WASHING

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JANUARY 2012

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RUTH DOYLE  
ANNA DAVIES

# INTRODUCTION

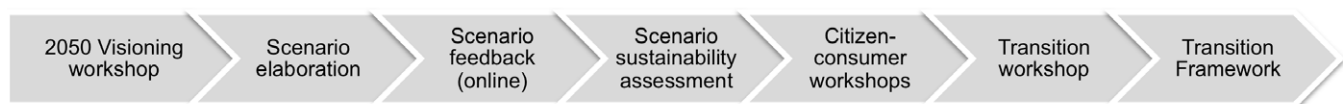
This document reports on the output of the CONSENSUS sustainable water use Transition Workshop held in October 2011. The aim of the workshop was to develop a Transition Framework containing possible policy, education, research and business interventions to pave the way towards a future of more sustainable personal washing practices in Irish households. The workshop engaged a range of stakeholders related to the water sector in Ireland (North & South) from public, private, semi-state and non-governmental organisations. These stakeholders represented a variety of professional backgrounds from architecture and design, to policy, planning and communications.

The Transition Workshop represented the final phase in an iterative, backcasting research process. Backcasting is based on the collective development of desirable future visions, followed by looking back (backcasting) to see how a transition towards that future could be achieved. As opposed to other futures techniques, such as forecasting, backcasting is valued for its potential to widen perceptions about sustainability problems and develop trend-breaking, holistic solutions. The CONSENSUS research project uses backcasting in an all-Ireland context as an innovative, creative means of developing alternative scenarios for sustainable household consumption and long-term action plans to work towards their achievement.

## PRACTICE-ORIENTED APPROACH

In approaching the problem of home water consumption, the research adopted a 'social practice' approach that focused on people's use of water for everyday tasks and household chores. The practice of personal washing (showering, bathing and sink usage) was taken as the primary unit of analysis as it represents the highest end-use of water in Irish households accounting for c. 38% of final consumption. The social practice approach contrasts dominant conceptions of human behaviour that tend to overlook limitations imposed by existing technological or social contexts that 'lock' people into patterns of consumption. Instead, this approach notes the variety of social, infrastructural and institutional elements that shape our daily practices. In the context of washing practices, these elements are; technological (e.g. showering units, taps, sinks, baths), organizational (e.g. systems of water provision and regulations) socio-cultural (e.g. cleanliness norms and expectations) and personal (e.g. practical washing know-how).

## BACKCASTING PROCESS



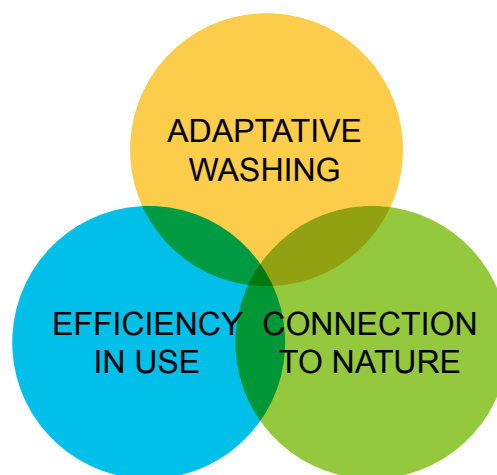
The backcasting process began with a stakeholder Visioning Workshop based on the question; what kinds of technological, organizational and socio-cultural innovations can we envisage in the year 2050 that might fulfill the needs of personal washing (cleanliness, refreshment, relaxation) more sustainably? In the Scenario Elaboration phase, proposals from the visioning workshop were developed into three distinct future scenarios depicting more sustainable washing practices [see: [www.consensus.ie/publications](http://www.consensus.ie/publications)]. Next, an online forum was created to gain feedback from the workshop participants on the scenarios. After this, the scenarios were subjected to a qualitative Sustainability Assessment to analyse their environmental, social and economic implications and Citizen-Consumer workshops were held to assess opinions of everyday users towards the scenarios.

Three 'Promising Practices' were then identified taking into account citizen-consumer feedback and the results of the sustainability assessment. Each Promising Practice focuses on the actions taken by a person to accomplish the task of washing detailing the motivations, technologies and systems of provision that guide their behaviour. The Promising Practices are not blueprints for the future, nor are they stand-alone, separate solutions. Rather, they represent future possibilities for more sustainable washing strategies containing bundles of ideas that may be synthesized or pursued in different combinations.

# PROMISING PRACTICES

## VISION FOR 2050

In the year 2050 people's washing practices are characterised by:



### 1) ADAPTATIVE & LOW WATER WASHING

Routine washing is replaced with **adaptive washing**. People are **conscious of when and how** they should wash and cultural norms support **reduced washing**. The need for water-based washing is reduced through the spread of **gel-based cleaning products** and **'deodorising clothing'** and personal **'dirt and odor monitors'** help in washing diagnosis.

### 2) EFFICIENCY AND VALUING OF WATER

Regulations promote **efficiency in appliances** and users strive for efficiency in their water use. People are **engaged** in setting shower cycles and programming appliances through **'home water monitors'**. Advanced filtration has permitted the **use of greywater** multiple times between washing appliances. **Volumetric, variable charges** encourage wise use. Individuals and communities who reduce their water consumption are **rewarded**.

### 3) CONNECTION TO NATURE

Householders are **connected to natural** rain fluctuations. They are engaged in **rainwater harvesting** (individual households & communal harvesting) and have **greywater systems**. **Dual stream** water systems for potable and non-potable water ensure that **users match the quality of water with the required end-use**.

## TRANSITION FRAMEWORK DEVELOPMENT

The Promising Practices were presented at the Transition Workshop in October 2011 and participants were asked to think of educational, research and development, community, economic and regulatory interventions that collectively could work towards their achievement. These interventions were then planned out over time, and after further processing by the research team, a comprehensive Transition Framework was created.

This document presents these interventions in a visual timeline over short (2012-2020) medium (2020-2035) and long (2035-2050) time scales. Interventions are categorised according to the following different types:

- Ⓐ **Policy** (e.g. economic tools, design and building regulations)
- Ⓔ **Education & Engagement** (e.g. educational programmes, community initiatives, awareness campaigns)
- Ⓓ **Research, Technology & Business** (e.g. Research & Development, economic investment)

The document concludes with a list of **challenges and drivers** as identified at the Transition Workshop that may impact the implementation of the Transition Framework. A note is also provided on the potential **actors** that would need to be engaged in order to carry forward the recommended Transition Framework.

# TRANSITION FRAMEWORK

Short (2012 - 2020)

Medium (2020 - 2035)

Long (2035 - 2050)

ADAPTATIVE

- ⓔ Campaign for adaptive washing strategies & targeted cleaning
- ⓔ School campaigns on efficient washing practices (in syllabus)
- ⓔ Sports centres and clubs healthy washing initiatives
- Ⓡ Research healthy washing levels (for different lifestyles)
- ⓔ Myth busting about cleanliness & hygiene requirements
- Ⓡ R&D deodorising clothing & causes of sweat
- Ⓡ R&D waterless, gel-based cleaning agents

- Ⓟ Regulation on advertising promoting excessive hygiene
- ⓔ deodorising clothing uniforms & 'Wash in Work' campaigns
- ⓔ Adaptive and low / waterless cleaning solutions
- Ⓡ R&D dirt & odor monitor

- Ⓟ Regulation & controlled messaging
- ⓔ Dirt & odor monitor mainstreamed.
- ⓔ Fully conscious & adaptive washing practices
- ⓔ Deodorising wear widespread especially for sport and workwear

EFFICIENCY

- Ⓟ New national water authority - 'Irish Water' established (existing policy)
- Ⓟ Sustainable Water Consumption Agency
- Ⓟ Water metering by 2015 (existing policy)
- Ⓡ R&D 'home water monitor' and water calculator
- ⓔ Communications supporting the need for water charging
- ⓔ Education on the value of water, the water cycle & supply system

- Ⓟ Holistic water management integrated into professional training
- Ⓟ 'Home water monitor' systems rolled out (link with energy)
- ⓔ Household benchmarking, eco-rewards and 'Tidy Towns' competitions

- Ⓟ Variable water pricing according to season & quality of water
- ⓔ Intuitive awareness of personal water use & embodied water
- ⓔ Public water consumption displays

- Ⓟ Efficiency improvements for water fixtures at the time of metering
- Ⓟ Building regulations for enhanced efficiency of water using fixtures
- Ⓟ Water Efficiency Rating (WER) for homes & products
- Ⓡ R&D systems for re-use of greywater between water appliances
- Ⓡ R&D for shower improvements (flow variations, live feedback)

- Ⓟ Tax breaks and in-store promotions for efficient devices
- Ⓡ Water calculator apps for water using devices
- Ⓡ R&D waterless showers, nano-particle cleaners

- Ⓟ Ban on water inefficient products
- Ⓟ Building regulations maximum 70 litres per person per day

CONNECTION

- Ⓟ Research rainwater harvesting RWH\* and GWH\*\* potential
- Ⓟ Pilot retrofit for RWH & GWH - link with energy retrofit programmes
- Ⓟ Build skills & accreditation for water retrofit programmes
- Ⓡ R&D for rainwater monitor, advanced filters for RWH and GWH
- ⓔ Myth busting on greywater & rainwater & health risks
- Ⓡ Business support & investment in 'Hydro-nation' economy
- ⓔ BT Young Scientist - water theme

- Ⓟ Nationwide water retrofit - GWH, RWH, rainwater monitors
- ⓔ Retrofitters to provide education on water efficiency
- Ⓟ Building regulations for RWH & GWH systems - individual & communal
- ⓔ Public buildings and schools water programme, develop Aqua Park
- Ⓡ R&D 'dual water systems' infrastructure - match water quality with use
- Ⓡ R&D for 'Smart water grid'

- Ⓟ Rainwater harvesting systems are mainstreamed
- Ⓟ All schools are centres of smart water and best practice water use
- Ⓟ Dual water systems & GWH mainstreamed
- Ⓟ 'Smart water grid' implemented

ROI Universal water metering (commences 2012). Irish Water estd. 2013. NI Water Tax 2014

'Blueprint to Safeguard Europe's Water' - EU policy, sets targets for water efficiency to 2050

LEGEND

Ⓟ Policy

ⓔ Education & Community

Ⓡ Research & Business

\* GWH = Grey Water Harvesting

\*\* RWH = Rain Water Harvesting



Existing policy milestones

# ADAPTIVE AND LOW WATER WASHING

## SHORT-TERM (2012 - 2020)

- **Campaign for adaptive washing strategies and targeted bathing** – education for effective cleaning with low quantities of water and targeted bathing rather than full immersion / daily shower. Potential communications concepts /slogans include: “Wash Right”, “Share it, Spare it!”, “Splash n’ Dash”, “if its brown flush it down, if it’s yellow, it’s mellow”. Low water washing practices depicted in TV soaps (e.g. Fair City) or beauty programmes (e.g. Off the Rails). Engage journalists in “my week without washing” experiment and media tours to other countries overseas to demonstrate best practice and variability in washing routines and cultures.
- **School campaigns on efficient washing practices** - Tips on low water use integrated into primary and secondary education. Link to personal development, health and wellbeing subjects (e.g. SESE and secondary CPSE courses) with advice on healthy low water practices. Expand Green Schools (RoI) and Eco-schools (NI) programmes on water awareness.
- **Sports centres and clubs healthy washing initiatives** – Improve water efficiency in public spaces, especially sports clubs and gyms. These should be equipped with water saving devices and campaigns should promote norms of quick and efficient showering.
- **Research healthy washing levels** – Research to establish minimum washing levels for hygiene and cleanliness. Examine quantities of water, cleaning agents and frequency of washing required for different demographics and lifestyles. Potential private investment in this area.
- **Myth busting about required levels of cleanliness and hygiene** – Campaign to show that reduced or targeted bathing is not unhygienic. Potential link to health centres and GP offices.
- **R&D ‘deodorising clothing’ & causes of sweat** – Research to develop materials that are odor-eating, reduce sweat and promote bodily cleanliness.
- **R&D waterless, gel-based cleaning agents** – R&D for advanced gel products that provide cleanliness and refreshment without stickiness and hair/ body washing agents that require minimum water.

## MEDIUM-TERM (2020 - 2035)

- **Adaptive and low / waterless cleaning solutions** – Adaptive washing strategies are mainstreamed. Use of wash-basin for targeted bathing and shower improvements match water flow to washing need. Gel-based cleaning agents permit cleanliness with small quantities of water.
- **Regulation on advertising promoting excessive hygiene** – Tighter regulations are imposed on advertising that promotes excessive levels of cleanliness or unhealthy expectations of beautification. The aim is to keep in check the trend for escalating expectations of personal cleanliness and grooming.
- **Deodorising clothing uniforms, ‘wash in work’ campaign** - Promotion of deoderising clothing (In-work campaigns for smart deodorizing attire). School uniforms are odor-eating to ensure longer usage prior to clothes washing and to reduce the need for personal washing. Employees are encouraged to ‘wash in work’ especially when home rain water levels are low.
- **R&D ‘dirt and odor monitors’** - Research personal ‘dirt and odor monitors’ that diagnose if and where a person needs to wash. This device aims to provide users with confidence in their personal washing decisions.

## LONG-TERM (2035 - 2050)

- **Fully conscious and adaptive washing** – combination of educational and awareness initiatives has led to fully conscious washing behaviour. People alternate between splash washing and showering and use gel-based cleaners for low water cleaning.

- **Regulation and controlled messaging** – consistent messaging and advice on appropriate and healthy washing practices for people and the environment from all societal actors (business, civil society & government).
- **Deodorising wear widespread** – day and work wear clothing have deodorising properties, are breathable and require little washing.
- **'Dirt and odor monitors' mainstreamed** – dirt and odor monitors help people identify if / when they need to wash.

## EFFICIENCY & VALUING OF WATER

### SHORT-TERM (2012 - 2020)

- **Irish Water established (as per existing policy)** Transfer of responsibility for water services in the Republic of Ireland from 34 local authorities to Irish Water, a new national water authority
- **Sustainable Water Consumption Agency (SWCA):** Establishment of a Sustainable Water Consumption Agency to serve in a research and advisory role on water demand management with the responsibility of administering awareness and water efficiency retrofit programmes. The SWCA could be an independent body or subsumed into Irish Water, the EPA or Department of Environment. The agency should promote holistic strategies involving measures to reduce demand, decentralized water supply and treatment systems, ecological landscaping, and water re-use and recycling systems appropriate to the ecological limits of a given area. Sequential targets for the reduction of water consumption by sector (residential and other) should be set and built into long-term water management strategy. Develop green public procurement guidelines and creation of 'best available' technology list for water efficiency in the home.
- **Water charging:** Introduction of water meters and volumetric charging in ROI starting in 2012 to be completed by 2015. Water taxes introduced by 2014 in NI. Investigate potential for an integrated programme of water and energy meter installation.
- **R&D 'home water monitor' & calculation technologies:** research and develop systems that allow remote and in-home control/programming of water using appliances, revealing water usage (in litres) and related costs.
- **Communications supporting the need for water charging:** Communications on the requirement for collective action to work towards efficient water use within ecological limits. Stimulating people to be 'water wise' prior to the introduction of volumetric charging. Emphasises that infrastructural improvements are being made simultaneously and that significant savings can also be made by wise water use in the home.
- **Education on the value of water, the water cycle and supply system (in school syllabus):** Education in schools to promote understanding and appreciation of water, its linkages with human development and environmental problems associated with over-abstraction from natural water bodies and water pollution. Education on the quantities of water used for daily activities and embodied water (integrated into syllabus at all levels). Potential school visits to trace the water system cycle, from abstraction, to treatment, delivery and wastewater processing. Link with Eco-Schools (NI) & Green Schools programmes (ROI) and Discover Science and Engineering (RoI) campaign.
- **Efficiency improvements for water using fixtures at the time of water metering:** At the time of water charges, easily installable fixture efficiency improvement kits should be made available at reduced prices or for free. These could include low-flow shower heads and tap aerators, 'hippos' for toilet cisterns, shower timers or shower 'pebbles'. These fixture efficiency kits could be disseminated by dedicated 'water squads' developed in existing community or environmental groups (e.g. Tidy Towns), or made available at local authorities and libraries for collection.
- **Building Regulations require enhanced efficiency of water using fixtures:** Elaboration of regulations beyond current requirement for dual toilet flushing to include requirements for minimum efficiency of all water fixtures in new build. Targets could be set according to the average daily water use by occupants of that home. These could move through stages reducing from current level (c. 150 litres per person per day) to an ultimate target of c. 70 litres per person per day in 2050.

- **Water Efficiency Ratings (WER's):** Required for homes for sale, rent, or in new build. This reveals the water efficiency of the home (similar to current Building Energy Ratings, BER). WER's are accompanied with "effective use" manuals for homeowners showing them how to effectively heat their water and maximize the efficiency of their current appliances with recommendations for water efficiency retrofits. WER labels are also required for water using appliances, showers and taps, illustrating litres of water consumed per cycle/use.
- **R&D systems for direct reuse of greywater between home appliances** – Research the potential for the development of connections between water using appliances (washing machines, showers, sinks etc.) so that light grey water can be purified and temporarily stored in the home for re-use again, before being used for toilet flushing or irrigation.
- **R&D for shower improvements (flow variations, live resource use information)** development of showers that move away from continuous flow to incorporate different water pressures including flow, lather and rinse stages that can be manually activated or on an automated cycle. In-shower displays with live updates on time, energy and water use and associated costs. Potential to pre-set shower time and flow prior to showering to retain full control. Investment in research for bidet equivalent device to allow for targeted body washing /splash wash.

## MEDIUM-TERM (2020 - 2035)

- **Holistic water management fully established and integrated into professional training:** Irish Water and the SWCA integrate 'soft path' approaches within official water planning and policy. Planning policy to require greater use of ecological landscaping for natural water purification and SUDS to reduce stress on wastewater treatment systems. Professional training in engineering, planning, architecture and plumbing for water systems that respect the natural hydrology and carrying capacity of the site, advance self-sufficiency, decentralized and regional solutions.
- **Home 'water monitor systems' rolled out (link with energy).** 'In-home and remotely accessible home water monitor systems provide information on water quantities consumed, end uses and associated charges and allow for remote control of water appliances. This ICT should be integrated with energy display systems so there is one central point in the home for resource management.
- **Household benchmarking, individual eco-rewards & 'Tidy Towns' low water town competitions:** Levels of household consumption are tracked and users can see how they compare to similar households and neighbourhoods through their water monitor systems. Households that reduce their water use by a demonstrable amount are awarded in the form of vouchers for efficiency improvements to water fixtures or eco-points that can be used for local, sustainable products, services. Inter-town competitions are held to encourage collective action towards low water consumption (potential link with Tidy Towns)
- **Water calculator apps for water using devices:** people actively check the water footprint of products and calculate potential water consumption and costs through water calculators to make sustainable purchasing choices.
- **Tax breaks and in-store promotions for showers and greywater connected appliances:** water efficient appliances have lower tax rates to facilitate users to reduce their water consumption and water bills. Water intensive devices are heavily taxed. In-store promotions of water efficient products, choice editing, voluntary labeling & information awareness campaigns in retail stores.
- **R&D waterless showers, nano-particle cleaning solutions:** research on steam based or waterless cleaning booths using a combination of steam, air or nano-particles.

## LONG-TERM (2035 - 2050)

- **Variable water pricing according to season and quality:** Water charges fluctuate according to season and variable weather conditions. Homeowners are engaged in tracking prices and tailor their daily water use accordingly. Knowledge is developed of different water quality streams and of the levels of water used for different washing activities. Advanced and remote programming of appliances is commonplace.

- **Intuitive awareness of personal water consumption and embodied water:** development of water calculators and water monitor systems has aided in understanding of the water volumes used in household washing activities. Intuition together with the use of ICT shapes household water practices.
- **Public water consumption displays:** live information on city resource flows and consumption including water use levels, displayed in prominent public spaces. “Spire-ometer”, the Dublin Spire serves as a live barometer for water use levels in the region. Information is also available online where individual homes and neighbourhoods are colour coded according to their levels of water consumption.
- **Building regulations target of 70 litres per person per day** – a limit of 70 litres of water use per person per day through water fixtures in the home is enforced. This target is achieved through effective washing behaviour, watchful water use, water conserving appliances, rainwater use and multiple reuse of grey water in households.
- **Ban on water inefficient products** – water intensive products are banned to be replaced with effective and efficient products. Greywater is used in washing appliances as water can be used and purified and then used again, creating a closed loop.

## CONNECTION TO NATURE

### SHORT-TERM (2012 - 2020)

- **Research residential rainwater harvesting (RWH) and grey-water harvesting (GWH) potential** – Study to map water availability across Ireland over time (taking into account climate change effects). Results are used to inform strategy regarding residential RWH and GWH systems and the possibility of a nationwide retrofit. Research on community level RWH & GWH and the potential of integrating energy and water retrofit training or merging retrofit programmes.
- **Pilot retrofit for RWH & GWH – potential link with energy retrofit programmes** – roll-out of RWH & GWH systems in target areas of low water quality / water stress or for low income households.
- **Build skills and accreditation for water retrofit programmes** – Upskilling for plumbing professionals on water efficiency retrofits (including installation of low flow taps and other water efficiency fixes, GWH and RWH). Develop professional accreditation for approved installers. All retrofitters are required to learn about sustainable water practices to provide education to homeowners.
- **R&D Rainwater monitor technology, advanced filters for RWH and GWH**– develop ICT to collect data on quantities of water collected in rainwater tanks and weather forecast to allow strategic planning of water use. Investment in the development of cheap, effective water filtration systems for rainwater and greywater so it can be used for non-potable applications including personal washing and clothes washing.
- **Myth busting on greywater and rainwater**– awareness campaign to dispel myths relating to the potential negative health effects of using greywater or rainwater. Promote the championing of this technology by key public figures and influential persons within social networks. Develop online forum for those with these systems to post their experiences and views to encourage others to follow suit.
- **Develop “hydro-nation” specialism through business support and investment** – ‘Hydro-nation’ or ‘Blue Economy’ specialism is promoted through support from enterprise agencies and financial incentives (focus on business development for water harvesting & reuse systems, low flow and low capacity appliances). Development of water competition as part of the IBEC Green Business Awards programme. Water themed Young Scientist to inspire youth and contribute to the drive for water related research in Ireland.

### MEDIUM-TERM (2020 - 2035)

- **Nationwide retrofit programme for household rainwater harvesting (RWH) and greywater (GWH) systems.** Homeowners must have water efficient fixtures prior to the installation of RWH or GWH. Develop an online rainwater harvesting map tool that homeowners can use to calculate the rainwater harvesting potential of their home (and associated costs and savings). Rainwater monitors installed showing weather forecast, rain availability

and the levels of washing that can be performed given water availability. The retrofit programme could be subsidized by Irish Water and small maintenance fees paid for their upkeep.

- **Retrofit installers to provide education on low water practices** – installers of RWH and GWH systems are required to provide advice on how to use their water systems efficiently and how to reduce their water use in the home.
- **Building Regulations for RWH & GWH systems** – building regulations developed that require GWH and RWH systems in new build and communal systems in built up areas/ apartments / estates. Continuous professional education in the building sector (engineers, architects, builders, plumbers) for best practice in water efficient design and technologies.
- **Public buildings and schools water programme.** Increase funding for the Green Schools water programme especially for demonstration projects on RWH and GWH and retrofit public and government buildings to include these systems. Cutting edge rainwater harvesting and greywater systems on display, and in use in an educational Aqua Park. Potential to link the Aqua Park with a centre for water research and innovation.
- **R&D Dual water systems infrastructure:** investigate the possibility for area-based dual water systems that redistribute household wastewater for non-potable uses. This would result in a dual charging system reflecting the quality of the water. Potable water delivered through existing infrastructure.
- **Research for a 'smart water grid-** investigate the potential for the development of water supply infrastructure that households can feed their excess harvested rainwater into. The water grid should also enhance management of water flows and include leak detection features.

## LONG-TERM (2035 - 2050)

- **Rainwater harvesting systems mainstreamed** – all homes have rainwater systems (required by planning law). These are implemented on community levels in densely populated areas while single dwellings have their own systems. The result is that the domestic sector is almost entirely off-grid, harvesting sufficient water to meet the needs of the residents while respecting the carrying capacity of its local environment. Residents are watchful of their rainwater levels and adapt washing accordingly.
- **Schools are centres of excellence** – water harvesting and greywater systems in all schools with associated educational programmes.
- **Dual water systems & GWH mainstreamed** – dual water systems in built up areas and GWH are mainstreamed. Natural, on-site water treatment systems enhance self sufficiency and **respect the natural hydrology of the land and the water needs of the ecosystem** and its inhabitants.
- **Smart water grid implemented**

## PARTICIPANTS IN THE BACKCASTING PROCESS

A variety of stakeholders from the NGO, public, private and semi-state sectors in the Republic of Ireland and Northern Ireland were engaged in the 'visioning' and 'transition' phases of this research. Participants came from a range of disciplinary fields including engineering, design, business development, planning, architecture, policy, research, advocacy, education and communications. This contributed to the diversity of ideas and collaborative learning amongst workshop attendees. These participants represented various organisations including; government departments, heritage councils, environmental groups, water device and washing product companies, software companies, environmental consultancies, consumer agencies and county council water services, economic development and public communications units.

**CONSENSUS would like to thank all the participants in the research process who kindly contributed their time and expertise and ideas.**

# CHALLENGES

## **Administrative/policy:**

Short term thinking, paucity of expertise in WDM (water demand management), resistance to regulation, fragmented measures, existing infrastructure, inertia, top-down centralized water provision, absence of clear policy direction, conservatism in built sector, data & informational gaps with regards water consumption, lack of EU direction for holistic water management and demand reduction strategies.

## **Financial:**

Investment required in infrastructure, new technology development, retrofit costs, costs of evaluation of measures and enforcement / monitoring of regulations, requirement to demonstrate pay-back

## **Socio-cultural:**

Water is not a valued resource, perceived abundance of water, low levels of awareness of quantities of water consumed, resistance to charging, expectations of cleanliness, perceptions of health risks relating to greywater and rainwater, link between intensive cleaning and standards of living.

## **Technological:**

Water and energy intensive washing devices, no design requirements for efficiency, low availability / uptake of efficient devices, low impetus for innovation.

## **Environmental:**

Water quality issues, reduction in water availability due to climate change, increased water insecurity.

# DRIVERS

## **Administrative/policy:**

Water charging, pay-by-use metering, expansion of EU policy for sustainable water consumption, water product efficiency regulations, binding targets for consumption reduction, polluter pays principle, build evidence base, CBA, good evaluation & feedback processes, enforcement, long-term, holistic planning.

## **Financial:**

Economic growth and availability of capital, public and private investment in water sector and water consumption strategies.

## **Socio-cultural:**

Population growth, greater awareness of water issues, socially unacceptable to consume excess water, pressure on government for action.

## **Technological:**

Investment in and nurturing of innovations for resource efficient water use, advancement in rainwater harvesting, purification, system delivery and greywater system technologies, smart resource management ICT mainstreamed. All competitively costed.

## **Environmental:**

Rapid climate change, reduction in water availability, increased water insecurity.

# ACTORS

Due to the variety of actions in the Transition Framework, involvement of and alliances between a range of societal actors (governmental, civil society, NGOs and private sector) would be required. Holistic approaches are required that marry technological efficiency improvements with the stimulation of socio-cultural changes towards the goal of 'sufficiency' (sufficient levels of consumption for environmental and social wellbeing). As such, education, policy, research, and business and technology agendas need to be integrated to promote a broader transition towards sustainable water consumption. This will require advancements in collaboration across government departments, with one central department (e.g. Department of Environment) playing a key role in the development of long-term strategy and integrating cross-departmental work (in for e.g. the Departments of Education, Energy, Employment, and Finance).

# ABOUT AUTHORS

## RUTH DOYLE

Ruth is a PhD researcher on the CONSENSUS project and is based in the Geography Department of Trinity College Dublin. Her research is concerned with sustainable home water and energy consumption in Irish households and uses a participatory backcasting approach to design innovations and action plans for a transition to more sustainable consumption practices. Prior to this research, Ruth spent over two years working as an environmental communications consultant after completing an undergraduate degree in Geography BA(Mod). In this role, she specialised in public consultation and environmental awareness campaign design and delivery. This experience has cultivated an interest in theories of behaviour change and creative methods for engaging the public in environmental issues.

## PROFESSOR ANNA DAVIES

Anna is Director of the Environmental Governance Research Group within the School of Natural Sciences at Trinity. She is the Principal Investigator of CONSENSUS, an EPA-funded all-Ireland research project examining creative measures to transform household consumption practices, including washing. For more than 12 years she has conducted research and published more than 40 articles and books in the field of environmental governance including the role of public participation in environmental policy making. She is currently an independent member of the National Economic and Social Committee, the RIA Geographical Sciences Committee and is on the editorial board of Local Environment and Geography Compass.

# ABOUT CONSENSUS

**CONSENSUS: (Consumption, Environment and Sustainability)** is a four-year collaborative research project involving Trinity College Dublin and the National University of Ireland, Galway. It examines four key areas of household consumption that currently impact negatively on the environment and inhibit our ability to achieve sustainable development across both Northern Ireland and the Republic: energy, water, food and transport.

The CONSENSUS project focuses on four key themes:

1. How to measure and evaluate consumption
2. How incentives for sustainable behaviours can be developed
3. Identifying the links between consumption, health and wellbeing
4. How matters of household consumption are being governed through institutional practice and participation.

This project was funded by the Science, Technology, Research and Innovation for the Environment (STRIVE) Programme 2007–2013 financed by the Irish Government under the National Development Plan 2007–2013.

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