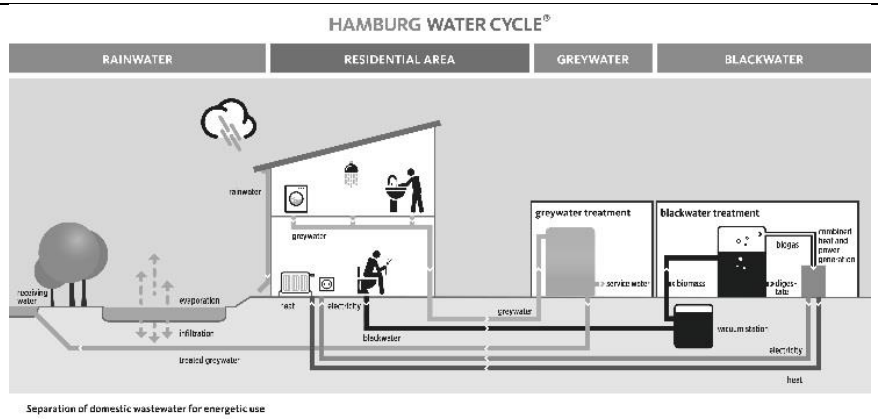
Supporting information

Method/ Abbreviation	**Explanation**	**References**
ABC analysis	The ABC -analysis is a method to structure objects into significance levels. Typically, objects with highest significance are allocated to level A, objects with medium significance to level B and objects with lowest significance to level C.	Dickie, H. F. (1951): ABC Inventory Analysis Shoots for Dollars, not Pennies", Factory Management and Maintenance, Vol. 109, pp. 92–94 Flores, B. E.; Whybark, D. C. (1986): Multiple criteria ABC analysis. International Journal of Operations & Production Management, 6(3), 38-46.
Analytical Hierarchy process (AHP)	The AHP is a method for converting subjective assessments of relative importance to a set of overall scores or weights. It uses pairwise comparisons between criteria and objectives to assess their weights.	Saaty, T. L. (1980): The Analytic Hierarchy Process: Decision Making in Complex Environments. In: Quantitative assessment in arms control, pp.285-308 Plenum Press, New York. Saaty, T. L.; Vargas, L. G. (2012): Models, methods, concepts & applications of the analytic hierarchy process (Vol. 175). Springer Science & Business Media.
Brainstorming	It is a creativity technique aiming to develop new ideas. Within a group, ideas are spontaneously formulated and collected. The ideas can be structured and evaluated at a later stage.	Osborn, A. F. (1942): How To Think Up. McGraw-Hill book Company. Clark, C. H. (1958): Brainstorming: the dynamic new way to create successful ideas, Doubleday, Garden City NY. Shaw, D.; Eden, C.; Ackermann, F. (2002): Evaluating group support systems: Improving brainstorming

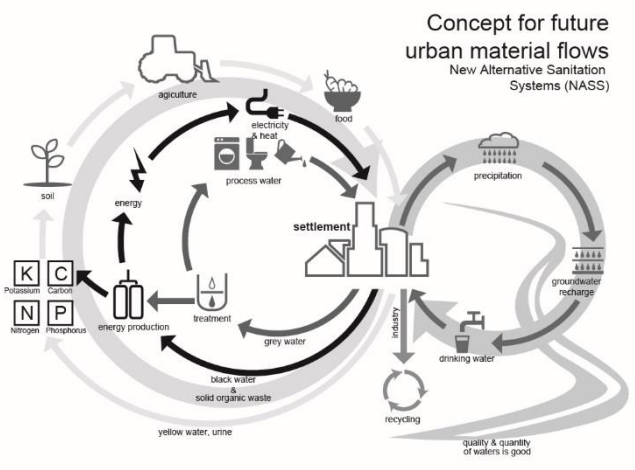
		research methodology. Aston Business School Research Institute. Wilson, C. (2013): Brainstorming and beyond: a user-centered design method. Newnes.
Brainwriting	It is a creativity technique aiming to develop new ideas. Each participant writes down its ideas. There is no mutual influence during the idea creation phase. Afterwards the ideas can be structured and evaluated.	Geschka, H. (1983): Creativity techniques in product planning and development: a view from West Germany. R&D Management, 13(3), 169-183. Van Gundy, A. B. (1984): Brain writing for new product ideas: an alternative to brainstorming. Journal of Consumer Marketing, 1(2), 67-74.
Hamburg Water Cycle®(HWC®)	The Hamburg Water Cycle® was developed by HAMBURG WASSER, the water supply and wastewater utility company of Hamburg. The HWC® concept includes the following characteristics (Skambraks et al., 2013): • Separation of different household wastewater flows at their source: black-, grey- and rainwater • Collection of concentrated blackwater via vacuum technology • Utilization of blackwater and biomass in a district anaerobic digester for local heat and electricity generation at a combined heat and power plant • Decentralized treatment of separated greywater • On-site management of rainwater to close local natural water cycles The HWC® concept is shown in the following figure.	Skambraks A.-K.; Augustin K.; Meinzinger, F. (2013): Key Factors and Challenges for Implementing the Large-Scale Integrated Wastewater and Energy Generation Concept HAM-BURG WATER Cycle® in the Settlement Jen-felder Au in Hamburg. International WaterWeek Conference, Amsterdam. HWC® website: http://www.hamburgwatercycle.de/english.html http://www.hamburgwatercycle.de/the-jenfelder-au-quarter.html

	 Separation of domestic wastewater for energetic use The HAMBURG WATER CYCLE® (© HAMBURG WASSER, 2016)	
Interviews	Interviews are a method of social sciences. Interviews aim to elicit information and opinions through discussion. They can focus on quantitative and/or qualitative information.	Gubrium, J. F; Holstein, J. A.(edt.) (2001): Handbook of Interview Research: Context and Method, Sage Publications, California. Gorden, R. L. (1969): Interviewing : strategy, techniques and tactics, Homewood
Mindmapping	It is a technique for collecting and structuring content. To create a mind map, the main idea is put into the center. From there all ideas and associations are interrelated amongst each other.	Buzan, T.; Buzan, B. (1993): The mind map book; BBC Books, London. Mento, A. J.; Martinelli, P.; Jones, R. M. (1999): Mind Mapping in Executive Education: Applications and Outcomes. The Journal of Management Development, Vol. 18 Issue 4; pp.390-416. Kokotovich, V. (2008): Problem analysis and thinking tools: an empirical study of non-hierarchical mind mapping. In: Design Studies Volume 29, Issue 1, January 2008, pp 49–69.

Morphological analysis	The morphological analysis is a method for investigating the totality of relationships contained in multi-dimensional, non-quantifiable problem complexes. It is a systematic heuristic creativity technique used to break down a problem into its partial characteristics. All characteristics are put in a matrix and are systematically combined with each other. This combining process allows to identify e.g. new alternatives.	Zwicky, F.; Wilson A. (eds.) (1967): New Methods of Thought and Procedure: Contributions to the Symposium on Methodologies. Springer, Berlin. Arciszewski, T. (2016): Inventive Engineering: Knowledge and Skills for Creative Engineers, Chapter 6. Ritchey, T. (2006): Problem Structuring using Computer-Aided Morphological Analysis. Journal of the Operational Research Society (JORS), Vol. 57, No. 7. Ritchey, T. (2002): Modelling Complex Socio-Technical Systems Using Morphological Analysis. (Downloaded from the Swedish Morphological Society at: www.swemorph.com)
Multi attribute value theory (MAVT)	MAVT is an MCDA method structuring a problem as a tree-like hierarchy of criteria and alternatives. MAVT links the chosen alternatives to real numbers for obtaining a preference order of the alternatives. In MAVT, one assumes that in every decision problem a real value function exists which represents the preferences of the decision-maker. The value function is used to convert the individual attributes into a single value. The alternative with the highest value is called the best.	Belton, V.; Stewart, T. J. (2002): Multiple Criteria Decision Analysis. An Integrated Approach. Boston, MA: Springer US. Eisenführ, F.; Weber, M.; Langer, T. (2010): Rational decision making, Springer Verlag, Berlin. Keeney R. L.; Raiffa, H. (1976): Decisions with multiple objectives: preferences and value tradeoffs. John Wiley and Sons, New York Hostmann, M.; Bernauer, T.; Mosler, H. J., Reichert, P.; Truffer, B. (2005): Multi-attribute value theory as a framework for conflict resolution in

		river rehabilitation. Journal of Multi-Criteria Decision Analysis, 13(2-3), 91-102.
Multi criteria decision analysis (MCDA)	MCDA is a set of decision support approaches which analyses multi-objective problems.	Belton, V.; Stewart, T. J. (2002): Multiple Criteria Decision Analysis. An Integrated Approach. Boston, MA: Springer US. Gregory, R.; Failing, L.; Harstone, M.; Long, G.; McDaniels, T.; Ohlson, D. (2012): Structured decision making: a practical guide to environmental management choices. Wiley-Blackwell, New York Keeney, R. L. (1992): Value-focused thinking: a path to creative decision making. Harvard University Press, Cambridge
Panel of experts	Panel of experts serve as a method for evaluation of experts' knowledge or judgement. A panel of experts includes various fields of expertise to debate and discuss various courses of action and make recommendations. They are an essential element of Delphi method.	Baker, J.; Lovell, K.; Harris, N. (2006). How expert are the experts? An exploration of the concept of 'expert' within Delphi panel techniques. In: Nurse researcher, 14(1), 59-70. Davis, L. (1992): Instrument review: Getting the most from a panel of experts. In Applied Nursing Research, Volume 5, Issue 4, November 1992, pp. 194-197. The State of Victoria Department of Environment and Primary Industries (2014): The engagement toolkit. Downloaded from http://www.dse.vic.gov.au/effective-

		engagement/resources/download-effective-engagement.
Set of objectives (SOO)	A set of objectives is a structured skeleton of objectives, criteria and indicators. Based on the SOO the consequences of alternatives and trade-offs can be identified, which are related to an aim or problem to be solved.	Keeney, R. L.; Gregory, R. S. (2005): Selecting Attributes to Measure the Achievement of Objectives. In Operations Research 53(1), pp. 1–11.
SWOT-Analysis	SWOT being an acronym for "strengths, weaknesses, opportunities and threats" is a support tool for decision-making. It analyzes the internal environment (strengths and weaknesses) and external environment (opportunities and threats).	Andrews, K. R. (1980): The Concept of Corporate Strategy, 2nd Edition, Irwin, Homewood. Mintzberg, H. (1994): The Rise and Fall of Strategic Planning. The Free Press, New York. Hill, T.; Westbrook, R. (1997): SWOT Analysis: It's Time for a Product Recall. In Long Range Planning, Vol. 30, No. 1, pp. 46 to 52.
TWIST++ technical concept	All technical concepts of the model areas are aiming to close water and material cycles. They specific solutions vary in each spatial setting. In general, the TWIST++ concepts includes the following characteristics: • Separation of different household wastewater flows at their source: black-, grey- and rainwater • In two case study areas: Collection of concentrated blackwater via vacuum technology • In one case study area: Utilisation of blackwater and biomass in a district anaerobic digester for local heat at a heat plant • Decentralized treatment of separated greywater • Recovery of process water • Alternative concepts for fire water	Menger-Krug, E. (2015). How can urban water infrastructures contribute to a sustainable urban metabolism? Trust - Cities of the Future Conference, Mühlheim an der Ruhr, 28. - 30. April 2015. Hillenbrand, T.; Dockhorn, T.; Felmeden, J.; Kaufmann-Alves, I.; Langergraber, G.; Lautenschläger, S.; Maurer, M.; Neuhausen, S.; Sigglow, J.; Steimmetz, H. (2014): New technical standards for resources-oriented sanitation systems in Germany. In: Thanikal, J.V.; Torrijos, M. (Eds) , Conference proceedings 12th IWA Specialized Conference on Small Water and Wastewater & 4th IWA Specialized Conference

	 Concept for future urban material flows in TWIST++ (© b.is, 2015)	on Resource Oriented Sanitation, 2-4 November 2014, Muscat, Oman, pp.14-21. Londong, J. (2015): Transition of infrastructure – a worldwide challenge. WasteSafe 2015, 4th International Conference on Solid Waste Management in Developing Countries, 15–17 February 2015, Khulna, Bangladesh. Projects' website with model areas: http://www.twistplusplus.de/twist-de/inhalte/Modellgebiete.php
(Written) Survey	It is a method for collecting information. Surveys can seek information that can be quantitative (facts and figures) and/or qualitative (opinions and values). Surveys can be delivered through face-to-face interviews, self-completion written forms, telephone surveys, or electronic surveys (The State of Victoria Department of Environment and Primary Industries , 2014)	Groves, R. M.; Fowler Jr, F. J.; Couper, M. P.; Lepkowski, J. M.; Singer, E.; Tourangeau, R. (2011). Survey methodology (Vol. 561). John Wiley & Sons. De Leeuw, E. D.; Dillman, D. A. (2008). International handbook of survey methodology. Taylor & Francis. The State of Victoria Department of Environment and Primary Industries (2014): The engagement toolkit. Downloaded from http://www.dse.vic.gov.au/effective-engagement/resources/download-effective-engagement.