



ensuring water access and visibility for every liter dispensed

The School of Engineering at Columbia University's qSEL laboratory is currently developing **Quench**, a pay-as-you-go hardware and software platform that offers an enhanced water management solution for rural, urban and peri-urban settings. Currently, consumers are willing to pay the small price for daily water and the associated costs that ensure quality and safety. However, last-mile delivery of drinking water from the utility to the consumer has been a challenge. Current utility payment systems are unreliable and incur high transaction costs. In addition, access to water primarily depends upon attendants that are prone to payment defaults jeopardizing customer service and solvency for the water scheme. Quench's simple, scalable, and sustainable prepayment platform remedies many of these issues.

The Quench Solution:

- Pay-As-You-Go, integration with current utility payment systems
- Utilizes a simple tamper-proof smart card system for water access. Options for WiFi or cellular access available
- Tight accounting of attendant purchases, vendor/co-op book-keeping, and utility sales/receivables
- Data collection and metric analysis of operation and transactions
- Modular design- can be adapted for homes, taps, kiosks, water tanks or an entire piping network
- Daily consumer lifeline amounts can be pre-allocated and can vary by season
- Open hardware/software systems

Robust Construction and Simple to Use

Quench has a rugged, low-cost and easily maintained modular design with plug and play components. During maintenance, the system can be converted to manual operation, allowing for continued water access. Extremely low power, inline units for retrofitting current kiosks as well as new single tap stand designs have been built and are ready for piloting.

Features for Governments and Operators

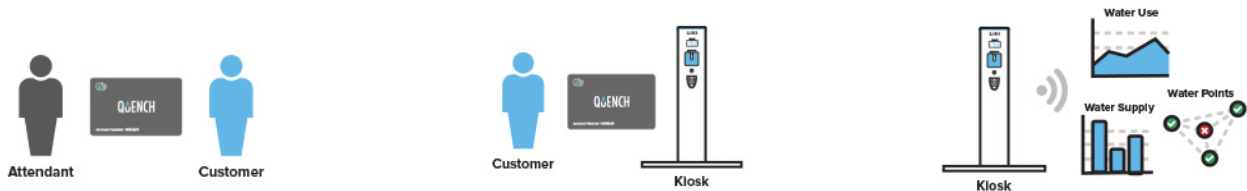
- Quench makes water schemes transparent. The system provides auditable transaction logs, allowing governments and donors to create performance-based contracts with water suppliers, ensuring improved maintenance of water points
- Local operators can design a payment model that fits their customers' needs, including pay-as-you-go, pre/post paid usage or part free/subsidized service
- Can be retrofitted to existing kiosks/taps or newly installed with existing water system
- Kiosk unit features a rugged, anti-tamper weatherproof design with plug and play components
- Kiosk can operate during maintenance
- Team willing to carry out tech transfer or help scale manufacturing: design modifications, maintenance
- Quench can connect to cellular/wireless networks to enable real-time metering and system monitoring.
- Very low power operation with solar, battery or line power options
- Simple, Sustainable, Scalable



Quench Tap Stand Using NFC Smart Card Technology

How Quench Works:

- Customers purchase credits from water utility or attendant
- The credits are transferred on to a Quench card
- The customer goes to a Quench kiosk and taps the card on the unit
- Water is dispensed to the customer and the credits are deducted from the Quench card



Quench Development Status

The Quench team has recently undergone a new development phase resulting with new tap stand units and software applications ready to be deployed. Our team is ready for discussions concerning demonstration pilots leading to scaled deployments or to provide custom prepayment and monitoring solutions and support. Please contact John Peacock at (jhp30@columbia.edu) to request an appointment and to be placed on our mailing list. Periodic updates can be found at qsel.columbia.edu

As of Fall 2016, Sustainable Engineering Laboratory is now Quadracci Sustainable Engineering Laboratory (qSEL) through a generous gift from the Windhover Foundation. The Laboratory Director is Prof. Vijay Modi of Department of Mechanical Engineering.