

**ClickSoftware**

Making Service Click

# ClickSoftware

Solution for  
**Smart Metering** Projects



# Solution for Smart Meter Projects

## Introduction

With rising prices and uncertain long term supply options, energy is now a top priority. Governments, municipalities, and utility organizations are facing challenges in the areas of the quality of the environment, rising energy prices that affect the economy, the reduction of the oil and gas reserves, and the increasing consumption.

There is clear potential for saving massive amounts of energy and carbon dioxide emissions through widespread behavioral change. Therefore, there is a need to introduce cost-effective technologies that can impact positively upon fuel bills, match consumption with generation, and reduce carbon emissions.

Smart Meters are digital devices that provide real-time, or near real-time, accurate electricity usage information to both utilities and their customers over different time periods. Using Smart Meters enables the accurate visibility of energy consumption providing the following benefits:

- More accurate customer bills which limit customer queries and improve customer experience.
- Customers can better plan their power consumption.
- Flexible tariffs that can be changed quickly, easily and cheaply to encourage demand reduction or time shifting.
- Improved and optimized grid management.
- Environmentally Friendly - contributing to a reduction in overall consumption and a corresponding decrease in carbon dioxide emissions.
- Alternative communications into the building, enabling the utility to offer home management services.



Available evidence suggests that smart meters can reduce energy use by between 3% and 15% through changes in behavior. For example, the Energy Saving Trust estimates that UK homes waste more than £900 million each year just by leaving appliances on standby, with almost two-thirds of us leaving lights on in empty rooms.

# Solution for **Smart Meter** Projects

## The Global Landscape

The U.S. Federal Energy Regulatory Commission predicts that by 2012, 89 % of U.S. households and 41 % of European households will have Smart Meters, sparked by emerging legislation calling for energy conservation.

Smart Meter projects are already in progress around the world. In 2003, Enel, the largest power company in Italy with over 27 million customers, rolled out a smart metering project at a cost of \$3 billion. Enel expects to save over \$700 million per year on energy conservation and reduced staffing needs.

In the U.S., utilities in California, Texas, and Illinois are rolling out Smart Meters widely. For example, Pacific Gas and Electric Company, one of the largest combination natural gas and electric utilities in the United States, is planning to deploy 9.3 million Smart Meters for its 5.1 million electricity and 4.2 million gas customers.

Deployment is scheduled to begin shortly (Fall 2008) in Bakersfield, California, with the system-wide deployment completed in 2011.

In Canada, the Ontario government's Smart Meter initiative requires full implementation of 1.3 million Smart Meters throughout the entire province by 2010.

According to a White Paper released by the UK Department of Trade and Industry, it is expected that all domestic energy customers will have Smart Meters within the next 10 years.

Utilities around the world are investigating the requirements to roll out such meter replacement projects. No matter how large or small the project, utilities need to take into consideration the potential impacts of such a radical change, including the rising need for crews and subcontractors, a high risk for missed appointments, more repairs and emergencies caused by improperly installed meters, frustrated customers who don't know how to use the Smart Meters, and other challenges. In some cases, the regulator can define the timeline of the project with the utility facing penalties if the deployment is not completed by a certain date. Without proper planning, the deployment can spiral out of control, incurring significant additional costs. However, with proper planning in place many of the risks can be mitigated.



# Solution for Smart Meter Projects

## Solution Guidelines - General Flow

The replacement of thousands, even millions of meters over a relatively few number of years is an extremely complex project that needs to be managed carefully. Due to the high cost involved with such projects, it is important that the execution be efficient. In order to ensure maximum control of costs and schedule it is critical to have the right processes and systems in place, including:

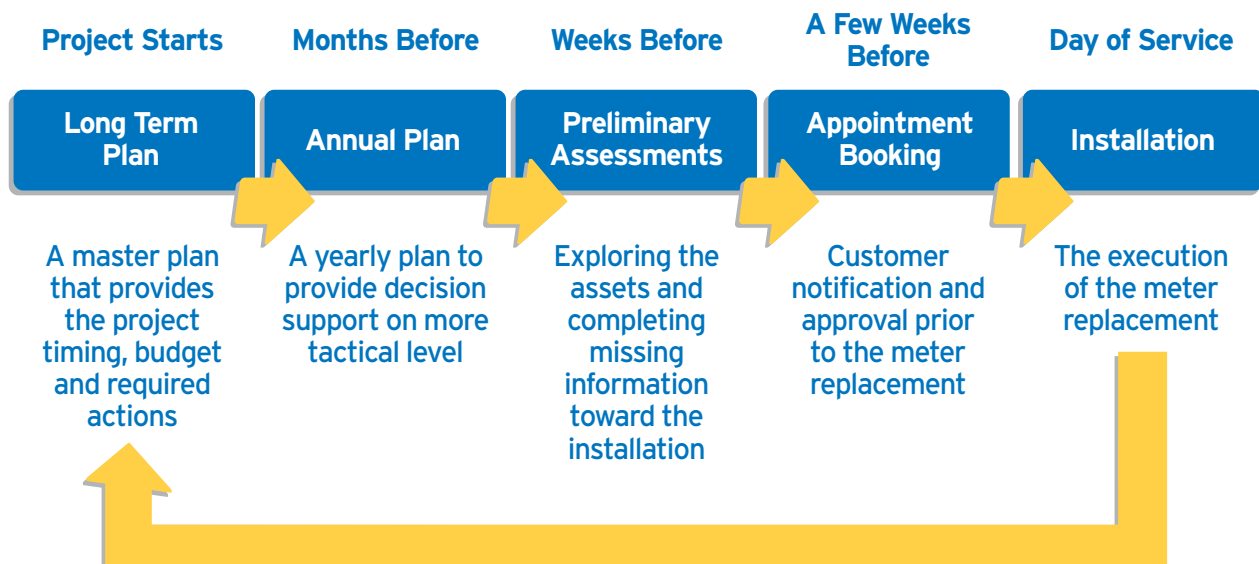
- Long-term planning: To prepare the organization to execute the project with the right capacity (parts, human resources, and so on).
- World class scheduling: To maximize resource utilization, minimize operational expenses (e.g., travel time), and maximize customer satisfaction by providing narrow appointment slots.
- Mobility: To eliminate the paperwork and streamline the ongoing monitoring of work carried out in the back office.



- Reporting and analytics: To provide the necessary information to all relevant parties.

The challenges and risks of such a long and complex project requires an automated solution that integrates planning, scheduling, mobility, and analytics to ensure successful implementation.

It is expected that a subsidiary or a subdivision of the organization will manage the meter replacement work. It is recommended that the relevant part of the organization be mapped into levels of geographical segmentation of the territory managed by the organization, for example, geographical (Region and District) or organizational (Customer Type, Business Line, etc.) hierarchies.



# Solution for Smart Meter Projects

## Long Term Plan

The first stage in planning the utilization of your workforce for such a project is to have a long term plan in a monthly, quarterly, and/or annual resolution for the period over which the organization would like to complete the project (for example, 4 years). The demands can be generated based on raw data that exists in the supportive backend solution, such as the ERP, CRM, or Legacy systems. In the absence of such systems, the information can be stored in dedicated database tables or even in Excel worksheets.



	2008	2009	2010	2011	2012
Alabama	100,000	100,000	100,000	100,000	100,000
Connecticut	100,000	100,000	100,000	100,000	100,000
Illinois	100,000	100,000	100,000	100,000	100,000
Indiana	100,000	100,000	100,000	100,000	100,000
Iowa	100,000	100,000	100,000	100,000	100,000
Kansas	100,000	100,000	100,000	100,000	100,000
Michigan	100,000	100,000	100,000	100,000	100,000
Minnesota	100,000	100,000	100,000	100,000	100,000
Missouri	100,000	100,000	100,000	100,000	100,000
North Carolina	100,000	100,000	100,000	100,000	100,000
Ohio	100,000	100,000	100,000	100,000	100,000
Oklahoma	100,000	100,000	100,000	100,000	100,000
Texas	100,000	100,000	100,000	100,000	100,000
Virginia	100,000	100,000	100,000	100,000	100,000
Washington	100,000	100,000	100,000	100,000	100,000
Wisconsin	100,000	100,000	100,000	100,000	100,000
Wyoming	100,000	100,000	100,000	100,000	100,000

Long term and annual planning enables optimal demand coverage and resource utilization at minimal cost

The Long Term Plan should provide the organization with the following:

- Setting the **timing** in which the meters will be replaced in each geographic area (e.g., Region, District).
- **Understanding the size of the workforce required** to complete the project, regardless of the current headcount (e.g., how many resources will be needed according to the required demands and skills).
- High level **gap analysis** between the expected demand and the actual workforce, whether they are internal resources or subcontractors that will be assigned to this project. The gap analysis will be done over the entire project, across the entire organization, and will reveal excesses and shortages of resource availability in different segments of the organization and in different periods.
- Understanding the required **budget** (human resources, travel time, parts, etc.) with the ability to produce the relevant reports.
- **What-if scenarios** to investigate the potential effect of different decisions, such as using subcontractors, new hires, or prioritizing different areas to be covered each year.
- **Plan vs. Actual Analysis** to present the progress of the projects according to the plans, with the ability to tune the plan accordingly.

The Long Term Plan should be reviewed and tuned every year.

# Solution for Smart Meter Projects

## Yearly Plan

The Yearly Plan will be created a few months before the start of the year. This plan will be in a monthly/weekly resolution and will include more granular demands, for example, the long term demand will be per Region and Quarter, and the yearly demand will be per District/Neighborhood and month.

This plan will provide more accurate insights and will provide the organization with the following:

- The timeline in which the meters will be replaced in each small area (for example District Atlanta South).
- **Gap analysis** between the expected demand and the actual workforce. In this stage, the gap analysis will be done automatically, taking into consideration the required skills and the expected mix of installation types (e.g., different houses may require different installation types). The gap analysis will be performed over the entire year, across the areas that were defined in the long term plan, and will reveal excesses and shortages of resource availability in different segments of the organization and across different periods.
- Understanding of the required **budget** (human resources, travel time, parts, and so on) with the ability to produce the relevant reports.
- **What-if scenarios** to investigate the potential effect of different decisions, such as using more subcontractors, relocations, training, or prioritizing different areas to be covered throughout the year.

- **Plan vs. Actual Analysis** to present the progress in the project according to the plans with the ability to tune the plan accordingly.

The Yearly Plan should be reviewed and tuned every week.

## Preliminary Assessment

If some of the information about the customers' properties or the current meters in use is incorrect, it is advisable to assess the area prior to scheduling the meter replacement. The assessment will later help determine the type of installation work required. The assessment can be performed in many ways. One way is by conducting one or two cycles starting with a high level review of the street (e.g., assess the types of buildings in the street), followed by a detailed review of some of the properties on that street (e.g., assess the meters of a selected house in the street). If preliminary assessment is required, it is advised allocating a dedicated group of resources to carry out this work. To enable analysis of the results of the assessment prior to scheduling the installation work, the system will automatically schedule the resources to do these jobs a few months prior to the expected installation day. It is anticipated that each resource will cover 20-30 streets per day as the system should be able to geographically cluster the work for the same area to a single field resource. The dispatching for the entire day can be done a day in advance. The task completion process should be done on site using a mobile solution.

# Solution for Smart Meter Projects

## Appointment Booking

Prior to the installation (e.g., two months), the organization should notify the customer of the planned timeframe during which the installation team will arrive. It is common to alert the customer through a notification delivered via the postal services. Depending on the organizational policy and regulations, each organization develops its own mechanism to attain the customers' approval. A web-based solution is one of the options, allowing each customer to approve the planned appointment or schedule an alternative visit on-line if needed. Simpler methods can be calling the customer or requesting the customer to call back if they need to change the appointment, or requesting them to send a response via the postal services. Regardless of the approval method in use, some percentage of the customers will not approve. If significant numbers of customers do not acknowledge the planned appointment, the organization should consider acknowledging these visits on-site by a dedicated team. Leaving too many of the appointments unacknowledged will likely result in costly, repeat visits.



It is anticipated that each resource will do about 20-30 on site acknowledgement tasks per day. In this case, the tasks should be automatically scheduled in advance, with geographical clustering of the work serving as a very important criterion. The dispatching can be done for the entire day in advance. The task completion process will be performed on site using a mobile solution. If a customer was not at home, a follow up visit will be scheduled until the resources meet all the customers who have not approved the planned appointment. While visiting customers and in the event that the planned appointment is inconvenient, the resource can reschedule the appointment immediately and get the customer's approval using a mobile application. Organizations may decide to refrain from scheduling the new appointment while on-site and follow up with the customers centrally through the main office.

For customers who have multiple meters, such as factories or large offices, the solution will create a consolidated appointment to replace all the meters at the same visit.

# Solution for Smart Meter Projects

## Scheduling and Executing the Installations

The installation scheduling and execution process includes the following stages:

1. The organization creates an installation task for every customer. Various parameters define the required installation; for example, the type of house, the type of meter currently in use, and the type of the new meter. Every task requires a different crew or resource type and the schedule will need to consider this and assign only capable resources. These tasks are scheduled far enough in advance of their due date in order to ensure the geographic clustering of the work. Based on the schedule, the system should be able to infer the appointment timeslot and fix the schedule around that slot. For example, if the organization is going to provide two-hour timeslots, a reschedule will only be possible between different resources within the fixed timeslot. After fixing the appointment slot, a message will be sent to every customer as described in the "Appointment Booking" stage.



2. The installation work will typically be performed by crews or individual resources. The crew size varies from two members to about five members depending on the complexity of the work. The crew lineup is typically stable and predictable, and changes are due to planned or unplanned absences. Once the day's work has been dispatched, it is very rare for the crew members to change during the day. An installation task is a combination of all the sub-activities performed by each crew member. The task aggregates the sub-activities and eventually sets a single duration for the entire job. In order to streamline the installation work, it is possible to send one of the crew members ahead to prepare the customer site and help them clear the meter area. The scheduling and dispatching functions consider the crew as one unit. This means that the installation task will be dispatched to the crew leader who will report progress for the entire crew. The crews should use a mobile device and report their progress while on-site. In some cases the Installation Task includes a number of steps which should be checked to ensure that health and safety precautions were taken into account.

3. If the customer is not at home at the time of service, the work order is closed and a follow-up visit is scheduled at a later timeframe. Alternatively, the work order can be suspended until someone is able to contact the customer to set up a confirmed appointment.

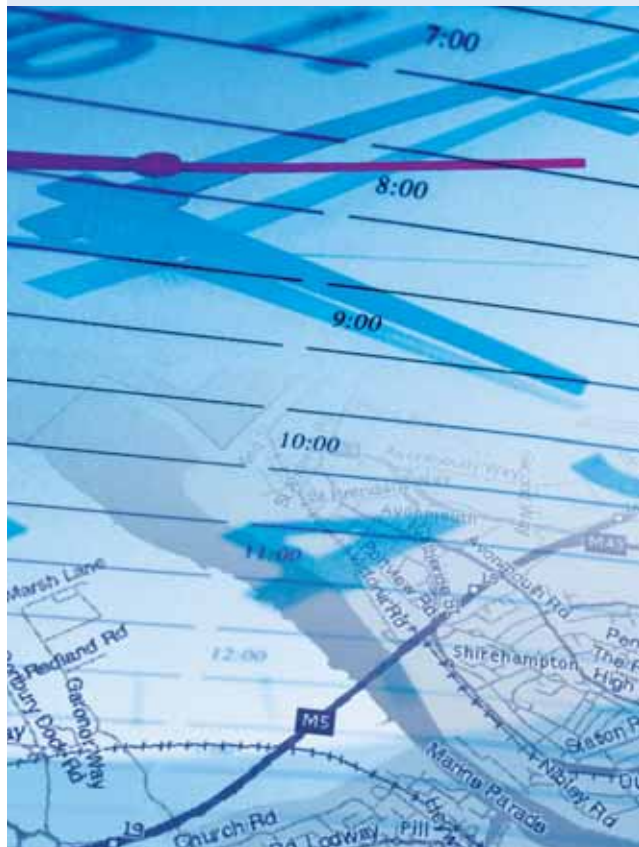


# Solution for Smart Meter Projects

## Subcontractor Work

Organizations may outsource a portion of the work to subcontractors. Outsourcing is anticipated in the following cases:

- Remote territories where all the work is done by contractors.
- Simple work that the organization would prefer not to undertake themselves.
- Overload of work that exceeds the capacity of the internal workforce.



Some organizations prefer to outsource the work to contractors who will then manage the work. The dispatching of the work in this case is done further in advance (e.g., one week in advance as opposed to one day in advance for the internal resources) in order to allow the contractor enough time to schedule and dispatch the work to the resources in his work management system. Other organizations prefer to represent the contractors' resources in their own system and then manage them like their own internal resources.

Different organizations practice different combinations of scheduling policies to divide the work between internal resources and subcontractors. For example, one organization may only schedule excess work to subcontractors. In this case, the scheduling system will be able to first utilize internal resources and then the subcontractors.

# Solution for Smart Meter Projects

## Miscellaneous

- Some organizations prefer that all work relevant to the old meters, as well as fixing and maintaining the new meters, be managed by different divisions of the organization and not by the same team that manages the meter replacements.
- If the organization decides to utilize the available resources from the Meter Operations business line, we recommend extending the solution by including forecasting and additional aspects of planning:
  - Forecasting — Organizations have peaks and troughs by work type that are well known and fairly predictable. Using a forecasting application and looking at the entire demand allows the Smart Meter team to allocate the Smart Meter installations to a region during their quieter periods, which will allow them to better utilize internal resources.
  - Planning — Gap analysis between the availability of the Meter Operations group and all the work it is required to perform (e.g., old meter installation, Smart Meter installation, repair of new and old meters). The gap analysis will be performed in line with the organizational policy; e.g., first utilize the resources to do ongoing work (Meter Operation) and then utilize the remaining availability for the Smart Meter project.



- Reserving Capacity — much of the work is known in advance, therefore it is recommended to reserve a portion of the resources' capacity for unplanned work (for example, repairs); Otherwise, all of the resources will be allocated to meter installation work.
- If the meter replacement requires enhancement of the network infrastructure to sustain the work of the new meters, a different segment of the organization will manage this work.
- It is advised to have a working back end solution such as CRM, ERP, or HR in place prior to starting the deployment of a workforce management solution.
- Some service organizations want the field resources to be able to access the GIS info on the mobile device so that they can see the upstream devices in order to shut off electricity when needed.

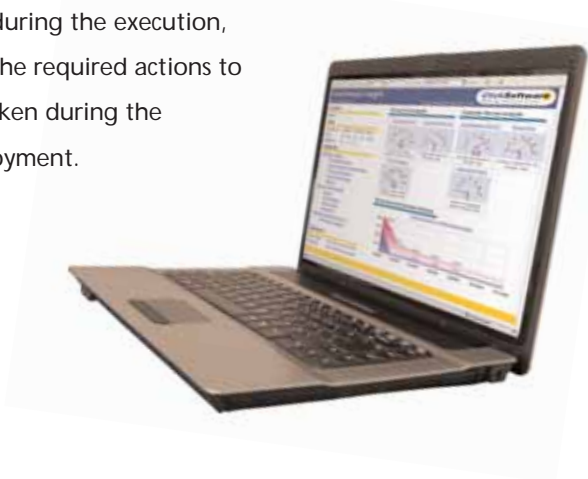


# Solution for Smart Meter Projects

## Specific Solution

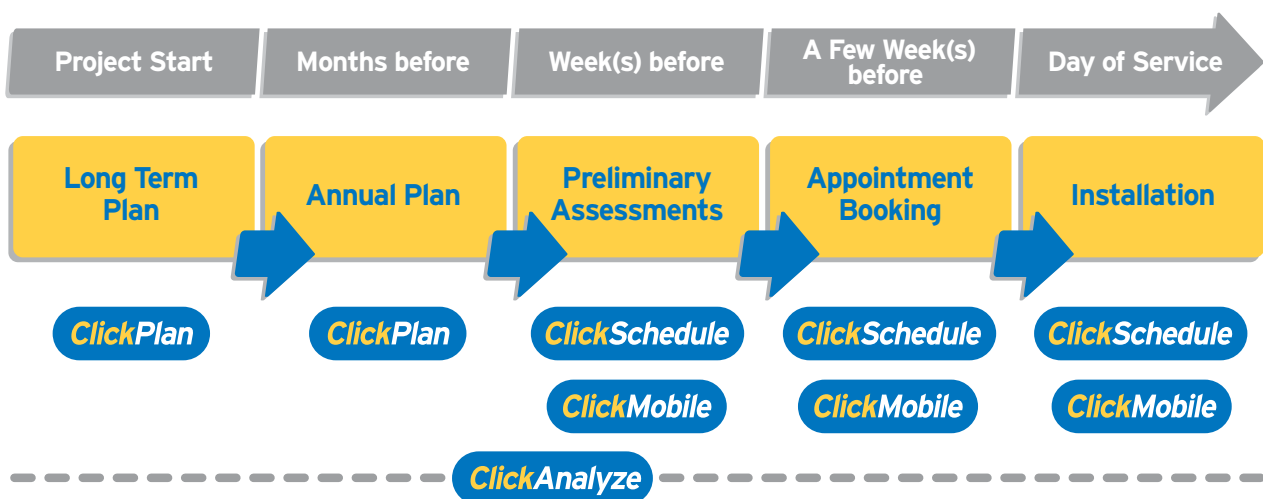
ClickSoftware has worldwide experience with utilities and offers an integrated, automatic solution that meets all of the above needs regarding the implementation of a Smart Metering project.

The solution provides visibility across the entire organization, an overview of the entire project before and during the execution, and the required actions to be taken during the deployment.



The solution is based on ClickSoftware's ServiceOptimization Suite of products and includes:

- **ClickPlan** (Long Term and Annual planning)
- **ClickSchedule** (Preliminary Assessment, Appointment Booking, Meter Replacement)
- **Street Level Routing-based GIS** (Preliminary Assessment, Appointment Booking, Meter Replacement)
- **ClickMobile** (Preliminary Assessment, Appointment Booking, Meter Replacement)
- **ClickAnalyze Reporting** (All stages)
- **ClickAnalyze Insight** (Preliminary Assessment, Appointment Booking, Meter Replacement)
- **ClickForecast** (Optional - Predicting additional Meter Operational work)



For more information about ClickSoftware solution for Smart Meter Projects, visit [www.clicksoftware.com](http://www.clicksoftware.com) or email [sales@clicksoftware.com](mailto:sales@clicksoftware.com).

# About ClickSoftware

ClickSoftware (NasdaqGS: CKSW) is the leading provider of mobile workforce management and service optimization solutions that create business value for service operations through higher levels of productivity, customer satisfaction and cost effectiveness. Combining educational, implementation and support services with best practices and its industry-leading solutions, ClickSoftware drives service decision making across all levels of the organization. From proactive customer demand forecasting and capacity planning to real-time decision

making, incorporating scheduling, mobility and location-based services, ClickSoftware helps service organizations get the most out of their resources. With over 130 customers across a variety of industries and geographies, and strong partnerships with leading platform and system integration partners - ClickSoftware is uniquely positioned to deliver superb business performance to any organization. The company is headquartered in Burlington, Mass. and Israel, with offices in Europe, and Asia Pacific.

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