

## **Proposal for ClearWire Mobile Broadband 4G Crisis applications.**

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### **Wildfire Crisis Control – 4G and Smart Grid**



#### **Crisis scenario**

Every year, wildfire costs a lot of damage over the country. In 2009, California alone had spent hundreds of millions dollars to fight against wildfires that burned more than 336,020 acres, destroyed hundreds of structures and killed people. Wildfire will likely to occur more often with the global warming.

#### **Problems definition**

Multiple simultaneous catastrophic fires, the largest and most destructive, have been attributed to power lines. Power line fires tend to be larger and more destructive than fires from other ignition sources. Not all electrical faults in a transmission network would be expected to cause fires. However, fires generally cause line outages.

Some of the critical problems that we are facing with wildfire fighting today are fast and effective detection, early response, the ability to prioritize fire danger, fire size and location in relation to topography. Corresponding utility company might want to selectively turning off power to high-risk areas during severe events. While removing power line fire ignition risk, this measure may increase overall fire risk in by hampering communications, fire-fighting, and evacuation.

## Proposal

Two key technologies, **4G Mobile Broadband and Smart Grid**, working together can help in early controlling of wildfires, saving money, people, homes and environment.

An integrated approach of multiple systems can be used to merge satellite data, aerial imagery, and personnel position via Global Positioning System (GPS) into a collective whole for real-time use by wireless Incident Command Center (ICS).

Detection systems may include wireless sensor networks monitoring temperature, humidity, and smoke. Sensors for smoke and fire are placed in the woods, especially near the power lines. In case the fire is caused by power lines or the fire is damaging the power lines, the affected location can be identified at the utility company's Control Center with Smart Grid. Information of the fire scene can be communicated to ICS for handling the crisis.

4G broadband network may be deployed ad-hoc or at towers covering the risky areas of wildfire. Besides providing the network backbone for sensor networks, 4G offers enough bandwidth for video and images send back from cameras in Unmanned Aerial Vehicles (UAV) or on towers to ICS.

With 4G and Smart Grid, utility company might selectively turning off power to high-risk areas in distribution network and not affecting communications of fire-fighting crews, minimizing the fire damage and effectively controlling power outages.

## Benefits

- 4G speeds deployment of temporary communications facilities, for disaster or crisis events and other occasions, for instance, which require temporary access for rescuer, and personnel.
- 4G brings real enhancements to communications capabilities available to emergency personnel and first responders, which will be able to benefit from not only voice communications, but also video and data transmissions to more effectively respond to situations and coordinate responses.
- 4G networks are IP-based and flatter with fewer nodes to manage. It will be interoperable with existing wireless standards and Smart Grid.
- WiMAX radios are predicted to have a lifespan of more than four decades; WiMAX can be as an effective disaster recovery solution.
- Command and Control centers are able to access the situation remotely with video cameras showing the crisis situation, 4G mobile broadband offers the high communication bandwidth.
- Fire fighting crew on the scene can share video on mobile devices to coordinate effectively with team members.