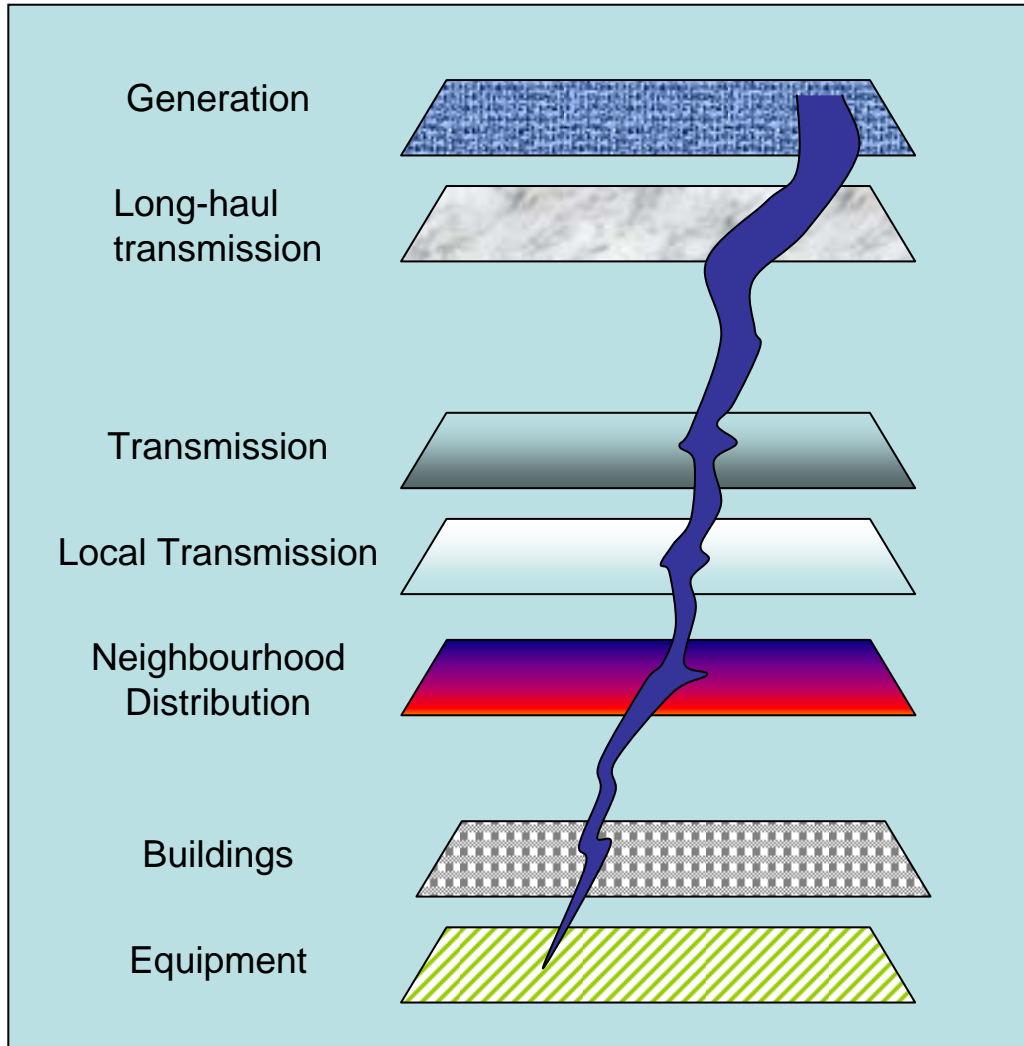


# The Power Grid has many layers...



Serious problems  
tend to spread  
in the power grid,  
maybe country-wide.

# The design of the Public AC grid makes it vulnerable...

- Few, but gigantic, large power stations are linked to millions of user sites via thousands of miles of power lines, very hard to protect.
- Each metro-area is often fed only by a handful of high-voltage connections.
- Serious problems tend to spread in the power grid, maybe country-wide.
- Of course the Public AC Grid must be protected as good as possible, but the responsibility for uninterrupted power feeding of critical loads has fallen entirely on the users. The Power boards take no responsibility for the individual load.
- Many essential business operations and society functions have critical needs for power feeding that never were satisfied. One reason may be that society and people have not realized the risks.

# The vulnerability of the Public Power grid has increased...

Routine type errors like

- Lightnings
- Transformer break downs
- Reactor break downs
- Rats in distribution bays
- Storm breaked power poles
- Fires in ducts and canalisation
- etc etc

tend to have **larger and more severe consequences** and spread due to increased dependency on electricity.

- The risk for deliberate damage and **terror** attacks.

***It is hard to even imagine a limit for the width of consequences for individuals and society – in economics, trouble and even life – even modest attacks or power break downs.***

# Increasing operational security of the existing power grid is an expensive affair...

- Multibillion investments have been asked for to make the existing power networks more rugged, duplicate and increase power station capacities.
- People let themselves be hypnotized by solutions that were invented a hundred years ago, and try to reinforce these.
- As a matter of fact **no product development whatsoever has been done during the last hundred years**, seen from the user's perspective.
- The power boards still provide us with more or less the same electricity as in grand-grandmothers days.

**Which other technical industry could have survived without product development for hundred years?**

# The electricity users have been forced to secure their power availability on their OWN...

And this is what they have done...

- Installed AC UPS equipment
- Installed diesel engines
- Got themselves ample supplies of batteries
- ...
- ...
- Which normally functions poorly when they become needed, due to poor maintenance and lack of competence.
- Expensive and underutilized investment, often giving hazardous environment side effects.

**But they are certainly not solutions fit to handle and satisfy the need for continuous power feeding during longer power break downs.**

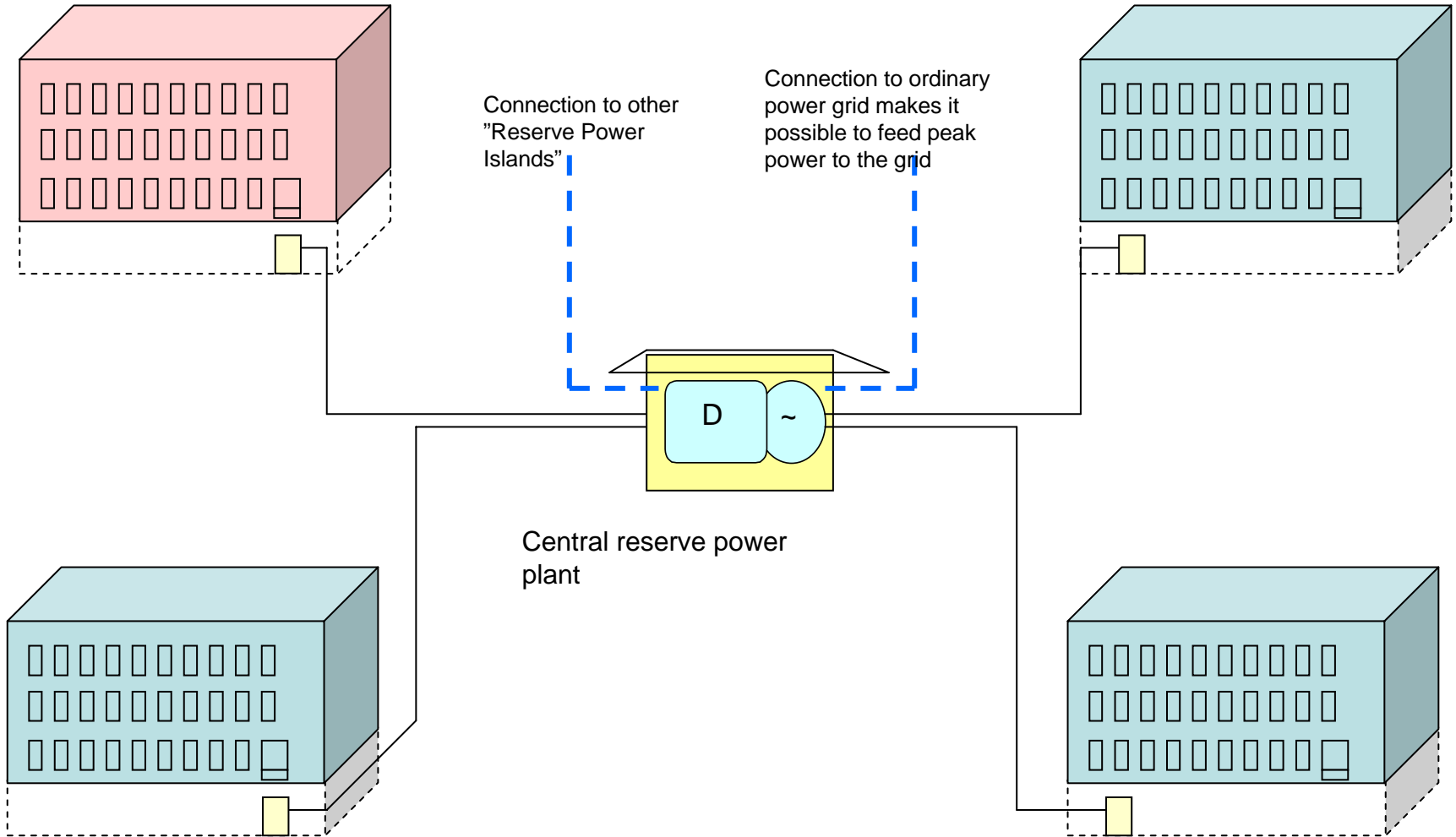
# But there are solutions...

- Build Public "Reserve Power Islands" tied together by an "overlay-network", separated from the ordinary power grid.
- This public overlay network may be subscribed for by industries, firms and individuals to use the power for critical loads.
- The Reserve Power Islands consist of both existing power units and complementary new units tied together.
- For the distributing network there are a number of newly developed solutions, using existing but separate canalisation.
- On the user side it looks like an extra power outlet, with secured electricity. No special devices or competence from the user is needed.
- Both power networks can be used as reserve for each other, building reliability through redundancy. A much more economic solution than just reinforcing the existing network.
- The Reserve Power Islands can be used for peak-shaving in peak-load situations. This will be a very economic way to replace the need for building new power stations.

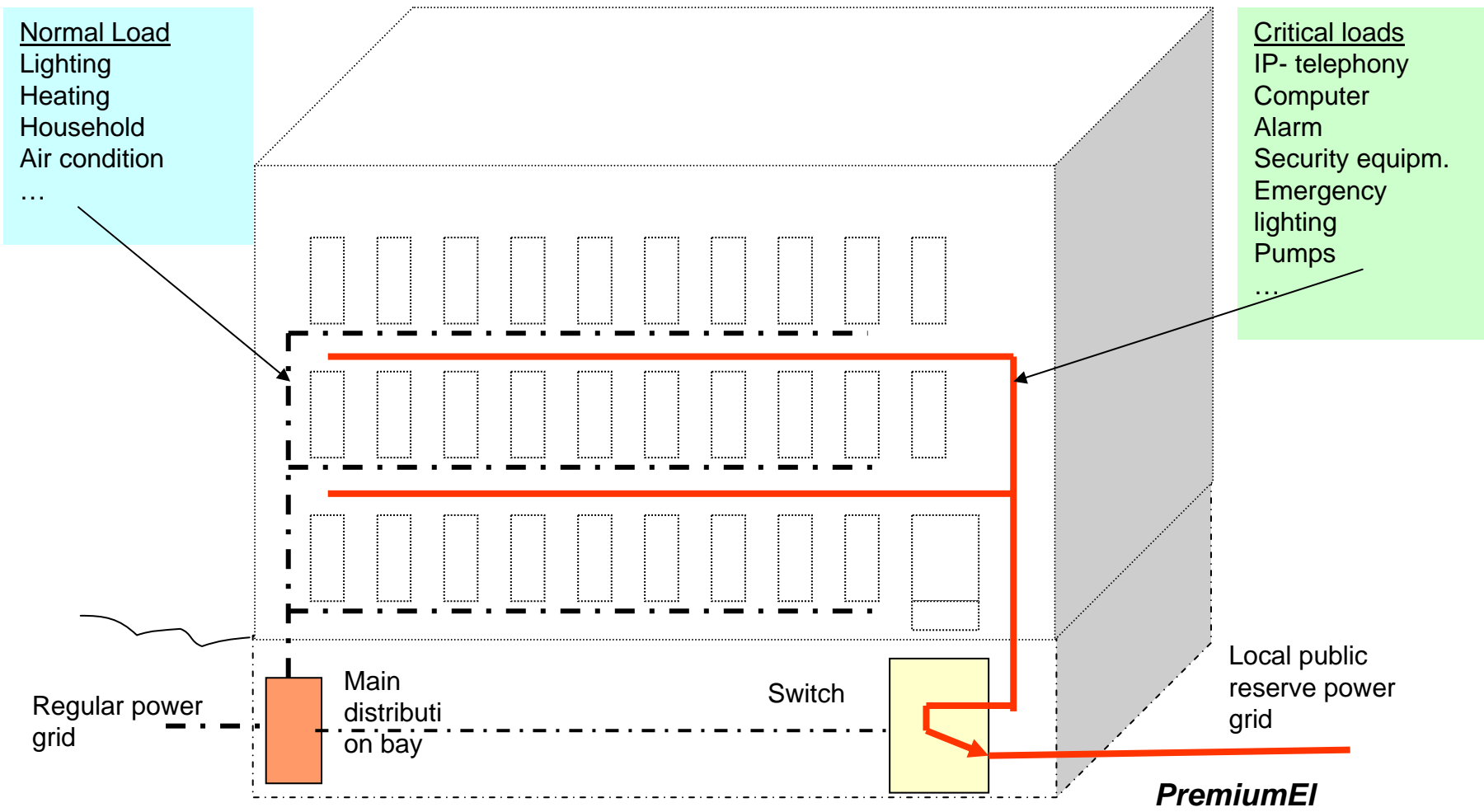
UPN AB has developed the solutions for PremiumEI

# Public "Reserve Power Island"

A centrally placed power plant supplies the subscribers with secured electricity.



# Premiumel in a building





# Redundancy is by far the most efficient way to build increased availability

