Tower**Power**

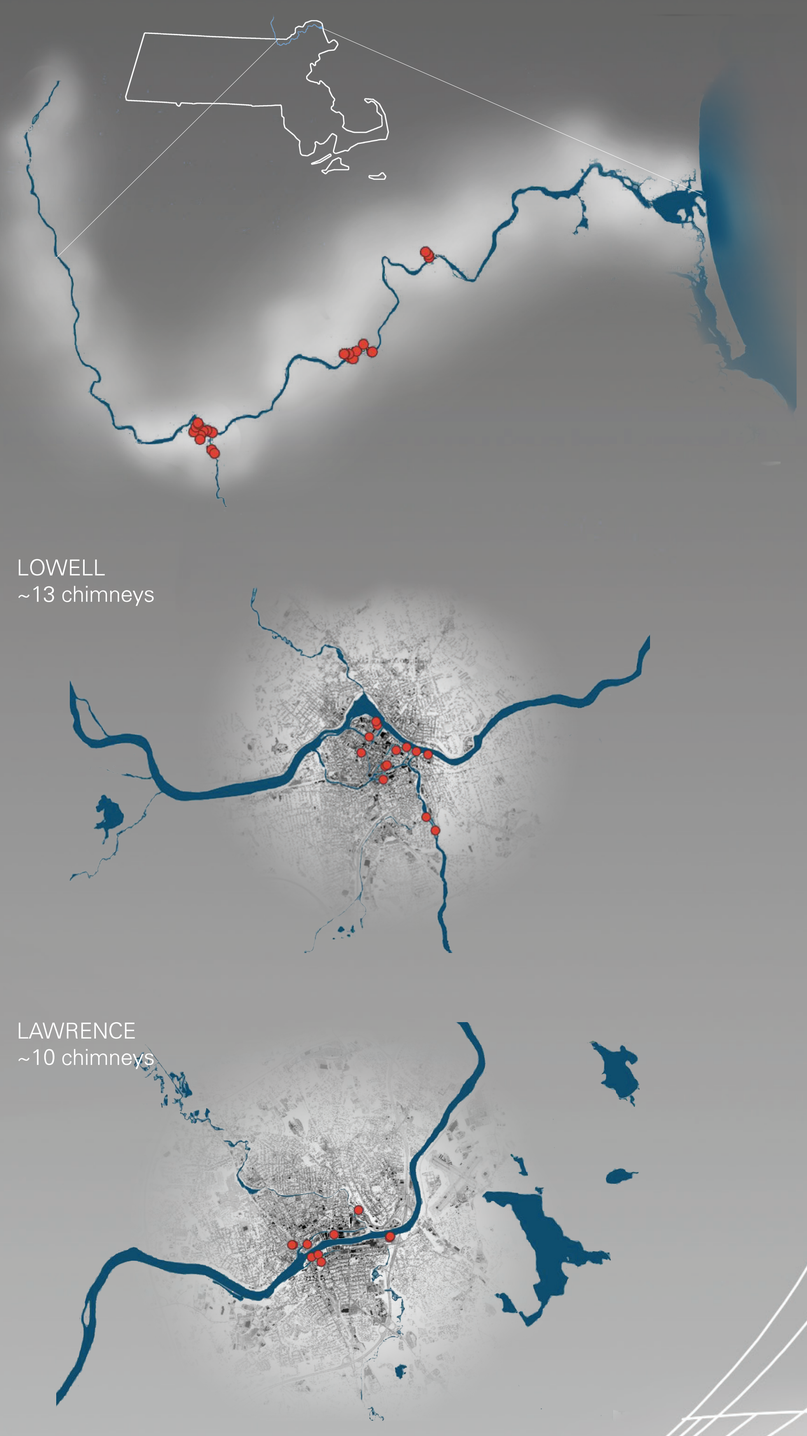
FROM ABANDONED NEW ENGLAND FACTORY CHIMNEYS INTO URBAN ENERGY GENERATORS ?

The modification of abandoned chimneys into 'solar chimneys' tap energy potential using standard wind turbines. The TowerPower strategy overcomes the main cost component of a sufficiently tall chimney in achieving efficient airflow where height is an advantage.

Many chimneys remain from the past industrial era of New England driven by the exploitation of regional rivers. These unused chimneys are relatively difficult and expensive to remove, and their reuse is a win-win opportunity for energy generation. The chimney network from abandoned factories could provide the backbone for a very low-cost quick entry into energy generation for the cities that developed around the previous industrial corridor. The abandoned factory complex could be converted into an attractive office complex or shopping hub, which provides an economic stimulus to the urban areas.

The research is a spin-off from an earlier MISTI supported project in China.

MANY ABANDONED CHIMNEYS ALONG THE FORMER MERRIMACK MANUFACTURING BASE

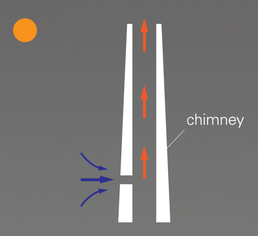


LOWELL
~13 chimneys

LAWRENCE
~10 chimneys

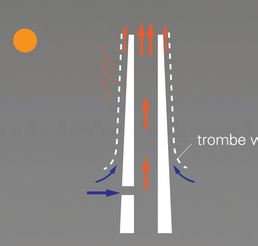
CHIMNEY

Warm indoor air rises up through the chimney and creates a pressure difference at the base, drawing in cold air from openings.



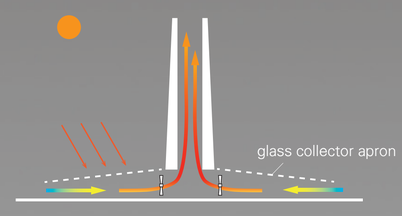
TROMBE WALL

A modified TROMBE WALL with translucent shell around the chimney, captures solar chimney through heating of air and increases airflow from the main chimney. It also heats the masonry chimney wall for more even continuous heating of air, also at night but with reduced flow from lower heat production. Polycarbonate glazing is considered as the glazing of choice.



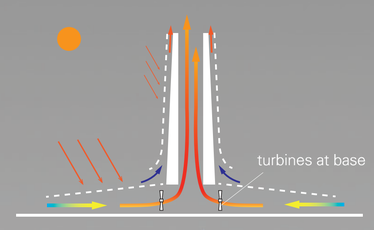
GLASS APRON

Air heated by solar radiation is captured under a glass roof and directed into the chimney. The glass apron utilizes a 'flexible capture' approach with polycarbonate panels. The top floor of an upgraded former factory complex would be glass, with shopping mall or greenhouse uses.



THE TOWER**POWER SYSTEM**

Chimney
Trombe Wall
Glass Collector Apron
Turbine



ADVANTAGES OF TOWER**POWER**

- LOW ENTRY COST
- CREATIVE REUSE OF ABANDONED STRUCTURES
- CLEAR, UNEMCUMBERED OWNERSHIP
- ECONOMIC STIMULUS TO AREA
- NO/LITTLE TRANSMISSIONS COSTS

CHALLENGES

- ECONOMIC FEASIBILITY: ENERGY OUTPUT vs. CONVERSION COSTS
- TECHNICAL FEASIBILITY OF CHIMNEY CONVERSION
- SUFFICIENCY OF YEAR-AROUND SOLAR ENERGY
- ADEQUACY OF NEW STATE-OF-THE-ART WIND TURBINES
- DETALIED TECHNICAL SPECIFICATION

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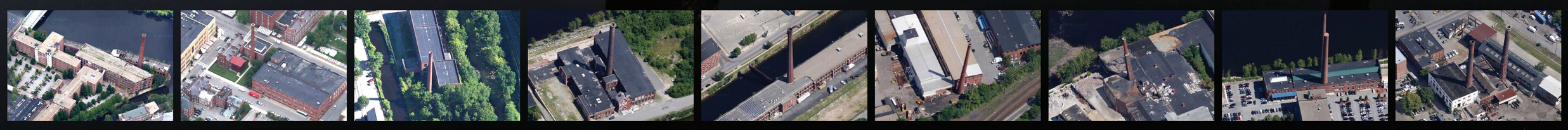

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