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Neighbors observe that the utility companies' \$100 million plan for tree removal is tantamount to deforestation. The "Elm City" and Hamden, East Haven and West Haven enjoy tree-lined neighborhoods, a source of beauty and pride, and an expression of our ecological responsibility. We want our trees.

But the electric company is mandated to provide reliable and affordable energy, and has to cut and trim trees to prevent major power outages. Vegetation is the single greatest factor in power outages, especially when combined with severe storms. UI does more "gardening" in some yards than the homeowner does.

The cost of outages is substantial: missed work and commerce, hotel bills for residents fleeing cold and dark homes, spoiled food, exploded pipes, purchase of private back-up generators (costing anywhere from \$500 to \$20,000 per household), extended school years. When commerce slows, tax revenues decline.

An insecure electric grid makes our area less desirable as a place to live and develop high-tech and other businesses. It increases the cost of living here and reduces the value of our property. Most costs fall upon our residents and business owners, not on the utility companies. We want our electricity, and we want it secure and affordable.

It is time to implement a project of **Underground Electric Line Management** ("Underground ELM"), of burying our electric and communications cables in New Haven and surrounding areas. I am referring to the local distribution lines in your neighborhood, the ones on the poles along the curb in front of your house ("primary and secondary distribution lines") and from the pole to your house ("service drops"), and not the giant transmission lines, which are a different issue.

Undergrounding improves reliability, allows us to keep our trees, and looks better. Undergrounding improves safety by removing poles that are a hazard to cars, and by hiding wires that are a hazard to people using ladders. The news media reported recently on fatalities that occurred when cars crashed into poles, a pole falling on a stroller killing a baby, and a hapless homeowner touching the "third rail" while fixing his gutter. The removal of poles will also open a few additional parking spaces or enable the installation of dedicated separate bike paths or full-width sidewalks. It will improve visibility at corners. In the longer run, undergrounding reduces the traffic-blocking utility trucks working on the poles and trimming the trees.

A New Haven Area project of undergrounding would provide ongoing work to our local electric workers for a decade, and longer, when implementation follows elsewhere in the state. Keeping skilled workers busy in Connecticut is better than the current plan of flying electrical workers in from Canada or Texas to repair storm damage, because the jobs will be local and the workers available for immediate deployment. They can spend most of their time undergrounding, and then be available for those occasional big storms.

Data from the past two decades shows that undergrounding reduces the incidence of power outages. This may be most obvious to us, as recent years have shown how ice storms and hurricanes can cause vast damage to the above-ground grid. While the repair time increases with undergrounding, the single biggest problem in our area has been the vast extent of outages at one time due to storms. Undergrounding reduces this single outlying factor. One of our biggest problems in our system is that too many lines can go down at the same time. Each segment that is buried is one less segment vulnerable to major storms and one less segment to fix when the big one hits. With climate change, we might be facing even more storms, as well as unprecedented heat waves – all of which play havoc on exposed wiring systems.

The [New Haven Independent](#) reported (5 Feb 2014) that United Illuminating said “the utility expects 10,000 customers to lose power in Wednesday’s storms.” If our lines had been underground, that

number would have been proportionally lower. And if the storm proved less severe and the outages did not occur, we would have paid for much of it anyway to the extent that the power company prepared for it. All of that expense could be averted.

In contrast, the gas company (in New Haven, owned by the same corporation as the electric company) manages to dig up the streets and repair gas problems rather quickly, because the rate of failure is relatively constant; but the electric failures come as massive widely-distributed multiple small failures. Undergrounding makes the electric lines more like the gas lines or water lines in that respect.

If we are going to trim our urban trees, it should be for public safety and the needs of the trees, not based on the location of power lines, and not paid by utility customers.

The time has come for Underground ELM, as we are forced to rebuild our urban roads and power lines, which have reached or exceeded their lifespan. Making our grid "smart" by using new technology will make it more secure and less expensive to operate. It will also include more possibilities for distributed generation, a topic which we have addressed for example in our discussions of rooftop solar electric generation.

And now is the time to install high-speed data cables in our dense residential areas. While we are at it, we need high-speed fiber optic cables so that we can reach the standards of more advanced nations such as Hong Kong, South Korea, Singapore, Romania, Lithuania, Japan, Latvia, Estonia, and Uruguay, or even of select US cities such as Chattanooga, all of which have internet far, far better than New Haven. You may have seen the NYT article a few days ago (3 Feb 2014 http://www.nytimes.com/2014/02/04/technology/fast-internet-service-speeds-business-development-in-chattanooga.html?_r=0) that pointed out that Chattanooga's internet speed is 50 times that of ours. New Haven's brilliant scientists and businesspeople need high speed to every home in our neighborhoods – that makes New Haven more attractive for the most ambitious and hard-working people.

Let us improve and not just replace our infrastructure. Even if the

roads are impassible during a storm, we should still be able to learn, work, shop and communicate in heated and lighted homes. As the national economy undergoes a transformation, secure power and data transmission are crucial to economic success.

We can share the cost of Underground ELM among homeowners, utility customers, electric and telecommunication companies and the state. Everyone benefits. Property owners can pay a small portion upfront on a per-foot basis and amortize a small portion in their utility bills. All utility customers can share the cost through a few cents added to their bills. As a multi-year project, costs will be spread over time, and utility company experts will be able to manage it in the smartest and most efficient way. Give homeowners some leeway about timing and payment options. Other cities and towns have done this already, and we can learn from their mistakes and successes. Towns like Northfield, Minnesota, or Anaheim, California, are nice places to live in part because of their secure, underground utilities.

Rural and suburban residents should gladly help promote a more secure grid for everyone, since the scope of major outages caused by downed lines will be reduced and more resources will be available to restore their power when the next storm hits, when distribution lines in places like New Haven are secured underground. If one-fourth of New Haven's lines were underground, then during that last big outage, one-fourth of the workers who were in New Haven restoring power could have been deployed to Woodbridge. It is only fair for rural and suburban residents to share the cost, as urban electric users historically have heavily subsidized rural and suburban users through the state-regulated price structure. Let the state provide tax credits to homeowners to partially cover their up-front installation expense, as undergrounding makes the **state** a better place to live, and reliable power improves commerce and state income.

A **minimalist** program would be to simply offer assistance to homeowners and building owners in selected high-density areas in undergrounding the lines from the curb to their homes or buildings. In the adjacent BEKI neighborhoods (Westville, Edgewood, Beaver Hill, West Rock), a typical run from the street to the house is 60 feet,

and most often two houses have connections just twenty feet apart. That means that a single trench from the curb to the house, and then a short perpendicular run between houses, can connect two houses.

Everything costs more in Connecticut, so the cost of trenching might be something like \$600 to \$1200 per trench, which could either be charged as a fixed number or a per-trench-foot number. Some communities created voluntary programs to allow homeowners (or 2 or 3 neighbors) to volunteer for undergrounding the line to their home, paying a portion up front, and then adding a small monthly charge to their electric bill for some period to pay the rest. The state then offers a 50% property tax credit on the initial outlay.

There are some places in this country where you can just call your electric company and have them bury the lines from the street to your house for just a few hundred dollars. That is impossible in Connecticut – because the utility just doesn't want to bother.

Once two or three or four adjacent homes have undergrounded their lines, the utility company would then be obliged to underground the lines along the street, within some period of months or years, at "their" expense, which itself would be recovered through the rate and tax structure and through payments from the data cable or phone companies. That is a *minimalist* program. A larger program could simply be more aggressive in incentives and timetables, and could include planning to underground streets as they are rebuilt periodically, independent of the homeowner's choice. Undergrounding could also be made a requirement for renovations over \$50,000 or sales over a certain figure, or with some other condition, to insure it occurs over time in a way that is manageable for our residents.

Installing undergrounding costs more than overhead wires, but it costs even more to have an unreliable system and to remove our trees. We run our natural gas lines under the streets and under our yards, even though it costs a lot more than it would to just have above-ground gas pipes. We underground our sewage conduits even though it would cost less to just let it run down the gutters. We pave our streets even though it would be less expensive to just cover

them with gravel. We fix our potholes – well, we don't, so forget that one. The point is that we have to look at the “real” cost and the “total” cost of these systems, and not just how much of the cost gets reflected in the utility bill itself.

The Register quoted a UI spokesperson on the cost of undergrounding that gave a figure that is fifteen times as much as is typical. There is some institutional lethargy, and these plans would require the municipalities, utilities and communications companies and the workers to all agree on a plan. But the utility companies' cost estimates are about the cost to the company of undergrounding; they don't take into account the cost to the consumer for unreliable power, lost work days, lost sales, backup generators, spoiled food, hotel bills, and the other expenses from power outages.

There are places where undergrounding is impractical due to various conditions, but many of our Greater New Haven neighborhoods are technically very good candidates, and that is where we should start. The power company is replacing a lot of lines anyway, and our streets will need to be rebuilt anyway, so now is the time to act.

Beyond the issues of reliability, tree preservation and safety, and the associated improvements in data communication, undergrounding has another major advantage: it looks a lot nicer. People who come from places that have already buried their utilities are startled by the backward and unsightly appearance of our nicest neighborhoods. If we wish to take pride in our community, it requires us to make it look nicer. The above-ground utility infrastructure is one of the ugliest aspects of the urban landscape, and now it is being made worse by removing or deforming our trees.

Underground ELM is an investment in our homes, cities and state -- and we can begin enjoying the benefits immediately. Let the Public Utilities Regulatory Authority work with the power companies, telecommunications companies, electrical workers and city planners to develop and implement a program to mandate or encourage undergrounding in New Haven and other high-density areas, so that we can save some of our trees, reduce tree and pole maintenance, enhance system reliability and beautify our neighborhoods. Let's

start with New Haven and its neighbors so the rest of the state can be inspired by our success and learn from our experience.

A word of warning to the electric company: Trees grow back.
A word of comfort to those upset by the deforestation in progress:
Trees grow back.

Let's get 20% of our City of New Haven power lines underground in the next 20 years and help make the City a nicer place to live.