

The next Norwich Energy Committee meeting is Tuesday, 8/25, 7 pm, via Zoom:
<https://us02web.zoom.us/j/86224687154>

Meeting ID: 862 2468 7154 877 853 5257 US Toll-free 888 475 4499 US Toll-free

The meeting agenda includes:

- statement of Act 92 compliance
- approve minutes, agenda
- public comment/correspondence
- Vital Communities Mobile Home Energy Savings Project (Ana Mejia)
- Resolution in support of Global Warming Solutions Act (Jack Cushman)
- E-bikes: planning for conversion workshop
- 2020 Solarize: ideas for outreach
- options for reducing emissions from Town fleet (Charlie Lindner, agenda attachments)
- updates...
 - *Button Up VT 2020
 - *Window Dressers
 - *Intermunicipal Regional Energy Coordinator
- other business, announcements

Idle Reduction Technology

I have been doing some research regarding idle reduction technology for the Norwich Energy Committee. At our June meeting Doug Wilberding mentioned this technology and that Hartford had explored one with some of their vehicles.

What I learned:

-There is a wide range of technologies for gasoline and diesel vehicles.

-For gasoline vehicles, there is technology that monitors the charge level of the battery and activates an automatic starter when the level drops to a certain level, and then turns off the engine when charge has been restored. I found mixed reviews. Idle right Technology, a particular brand, is the one I found the most information about.

-From a report of the Alternative Fuel Data Centers <https://afdc.energy.gov/case/3076>:

Vermont Clean Cities Coalition (VTCCC) and the City of Burlington recently partnered with the police department to pilot the Idle Right Fuel Management System technology on one of the city's 2011 Ford Crown Victoria police cruisers. Built primarily for emergency vehicles that require long periods of emergency lights flashing, the Idle Right device functions by monitoring the level of charge in the battery to idle the vehicle only when necessary.

Once the police department agreed to the pilot, the city's public works department agreed to cover the \$500 installation cost for the idle-reduction device and report on the program's cumulative fuel and emissions savings. After four months, the city's data showed the device not only reduced tailpipe emissions but was capable of saving 345 gallons of fuel and decreasing operating costs by about \$811 per vehicle annually. Given the results of the pilot and the low cost of the equipment, the city determined the payback period would be around six months based on fuel savings alone.

-In addition, UVM obtained a grant to install Idle right technology on their emergency fleet:

Proposal includes the following vehicles:

1 Mobile Command Vehicle (2011 Chevy Tahoe)

6 police Ford Explorer cruisers

1 Police Service Unit (Tacoma Toyota Pick-Up)

UVM's emergency vehicles house high tech equipment that require vehicles to idle in order to utilize mobile data, communication systems, lighting, and computers. The systems on emergency vehicles must run for the entirety of shifts and throughout incidents, which means vehicles remain idling for hours just to power the equipment in vehicle.

Given the successful pilot of the idle reduction system, Idle Right, with the Burlington Police Department, we propose the purchase and installation of 8 systems for 6 police cruisers (Ford Explorers), 1 Police Service Unit, and 1 Mobile Command Vehicle (Chevy Tahoe). Idling vehicles burn fuel unnecessarily, contribute to tailpipe emissions, and increase a vehicle's wear and tear.

If the Idle Right system reduces idling of each vehicle by two hours a day, the UVM police department will annually save:

- 2,760 gallons of fuel
- 32 tons of CO2
- \$6,488 of fuel savings plus additional for reduced maintenance costs**
- Given the results of the pilot the payback period for this equipment would be 6 months based on gas savings alone, if the installed equipment costs \$500.

Vehicle Cost estimates:

Havis Idle Right: \$185.00

Install per vehicle: \$168.00

Two Way remote car starter: \$399.00

Total per vehicle: \$752.00

Total for entire fleet changeover: \$6016.00

*Cost may decrease with purchase of multiple units and multiple installs.

We used the BPD pilot project as a baseline for our assumptions because the BPD's 2011 Crown Victoria's mpg rating is 16 city and 24 highway, compared to UVM's 2016 Ford Interceptor SUVs which is 16 city, and 22 highway.

BPD Pilot Project Period: 4 months

Vehicle Total Run Hours at Installation: 8392 (engine hours)

Checked Idle Right System at: 9272 (engine hours)

Idle Right system hours saved during this period: 232* (engine hours):

*service interval is 325, so this basically saved a service interval

**One hour of idling equals to about 30 miles of wear and tear on the engine, so if factored in maintenance costs and engine repair, the payback shortens even more. The BPD vehicle gets an oil change every 325 hours. Therefore, this technology will reduce the number of annual oil changes per vehicle by 2 each.

Assumptions for calculations: 2 hours of idling a day for 300 days/year and gas at \$2.35/gallon. Based on 232 hours saved by utilizing the idle right technology on a 4-month pilot. The V8 engine burns 0.47-0.68 per hour of idling so the figure 0.575 was used.

Tools for calculations: <https://www.afdc.energy.gov/prep/>

-On the other hand, I contacted UVM security, and the Sergeant who has overseen the project offered this feedback:

So here is the thing with the idle right. First, we got all of ours on a grant so I can't really speak to the cost. We had Yipes install them for us that cost was also covered by the grant. The system is really set up for vehicles that need to sit with lights on for an extended amount of time (think a Sheriff's cruiser being utilized for construction). In that case when the battery gets to a certain level the car will automatically come on and recharge the battery, when it is back up, the car will shut down again – theoretically saving on gas, and idle time.

As you may know, winter presents a specific challenge to Police in our region when it comes to idling the vehicles. This system is not the solution if that is what you are looking for. In order to not have frost / snow build up the cars will still need to run. My suggestion would be an auto start system (if you don't already have them) in which the idea would be if the car is sitting for an extended amount of time, the officer (or employee) for other municipal vehicles, can periodically start the vehicle remotely and let it run for a cycle of 15-20 minutes whatever the system is set for. Again, in theory, this would prevent some of the idle time.

I totally understand the idle issue, and the challenges it presents for municipal vehicles, especially police departments, unfortunately with MDT's, a very heavy electronics load, and the need to respond at a moment's notice, idling is something that is very hard to avoid without a garage to store vehicles in our region.

-Geoff Martin, Hartford's energy coordinator, shared the Burlington information and said the Hartford Police had not yet installed Idle right due to concerns the batteries might be drawn down too far and engines would not start in an emergency. He stated that Idle Right had offered Hartford a free trial of their technology.

-It is also not clear to me from what I read whether Idle Right works with hybrid vehicles, or if their partial reliance on the hybrid battery for the electric mode already turns on and off the gas engine in a similar manner.

If the Norwich Police Department will be slowly transitioning to hybrids, it may be worth exploring a “free trial” with the Havis Idle Right on a remaining gas only vehicle.

-There are other options for both gas and diesel vehicles. For gas vehicles there are also Battery Pack Alternate Power Units (APUs). These are large battery systems that require space and recharging, and take longer to reach a financial payback, but provide significant reduction in fuel use and emissions. For diesel vehicles there are battery APUs and diesel APU's that have a longer payback due to cost, but do significantly reduce fuel use and emissions. While researching replacement of fire fighting vehicles, exploring the cost/benefit of diesel APUs is something to consider.

The following link is a brief report and chart that gives an overview of idle reduction technologies: https://afdc.energy.gov/files/u/publication/idling_emergency-service_vehicles.pdf

There are also systems that provide heat for school buses that reduce the cost and environmental impact of idling school bus engines. Some general information is available here: <https://www.epa.gov/verified-diesel-tech/learn-about-idling-reduction-technologies-irts-trucks-and-school-buses>

Further resources for Idle Reduction Technology

<https://publications.anl.gov/anlpubs/2016/03/125155.pdf>

detailed report on a variety of IRT technologies...includes battery systems, diesel systems, and managed stop/start systems, looks at systems that maintain heat and AC for vehicles

<http://www.fuelsfix.com/2019/09/idle-reduction-technology/>

Article about UVM adopting Idle Right for their entire security fleet...from 2019

<https://afdc.energy.gov/case/3076>

another article re UVM's project

<https://www.epa.gov/verified-diesel-tech/learn-about-idling-reduction-technologies-irts-trucks-and-school-buses>

EPA report on idle reduction strategies for trucks and school buses

https://cleancities.energy.gov/files/u/news_events/document/document_url/109/2015_strategic_planning_presentation_idle_reduction.pdf

Clean Cities general document about a variety of idling issues and strategies for reduction

<https://www.fleetowner.com/equipment/article/21662971/choosing-an-idle-reduction-system>

this describes IRT's that provide heat and cooling for diesel vehicles without idling

<https://www.nowcar.com/blog/archive/does-auto-stop-start-technology-harm-engines/>

speaks to wear and tear of start/stops on an engine

<https://www.nowcar.com/blog/archive/does-auto-stop-start-technology-harm-engines/>

<https://www.government-fleet.com/155753/do-anti-idling-technologies-work>

report on Columbus OH and Clark Public utilities adopting IRTs