1. **Review October 17, 2017 Minutes***
   Matt asked why the committee decided not to discuss REC's, and suggested that this should be added to the minutes. Melanie explained that DPS counts targets based on siting, not energy end use, but said that this explanation could be added to the plan. This will be added to the minutes. Matt also asked whether municipalities can have local constraints that are more restrictive than the regional plan. This is an issue that will be discussed later in the meeting. Keith made a motion and Catherine seconded the motion, and the minutes were accepted.

2. **MTP Scenario Overview**
   Jason explained that because VEIC staff will be discussing the MTP scenario, he wanted to give an overview of what the MTP scenario is. CCRPC staff models different transportation patterns (vehicle miles traveled per person, the percent of commuters not driving, where people live, etc.) and construction/transit projects (changes in bus routes, new highway lanes, etc.) that will achieve the ECOS Plan’s land use and transportation goals, and picks a combination of them that balance between fixing congestion, fixing high crash locations and investing in areas planned for growth. The full presentation can be found in the packet here: [https://www.ccrpcvt.org/wp-content/uploads/2016/09/LRPC_Energy_agenda_Packet_20171128.pdf](https://www.ccrpcvt.org/wp-content/uploads/2016/09/LRPC_Energy_agenda_Packet_20171128.pdf)

3. **LEAP Analysis of the ECOS Plan MTP Scenario Presentation** *(45 Minutes)*
VEIC Staff presented the LEAP Analysis of the MTP Scenario. There is a LEAP model created for the state of Vermont based on the Vermont Total Energy Study, and the results of that are then regionalized based on regional data. CCRPC’s regional data has changed based on the modeling completed for the MTP model, so VEIC has re-run the model based on our new regional VMT data. Will asked whether any countries have used LEAP for national level energy planning. VEIC staff did not know. Matt asked what data on grid needs were incorporated into the LEAP model. Kate explained that this means that they took into account what grid capacity is for different levels of generation and distribution, and that many utility distribution engineers were involved in this process.

To refine the LEAP model based on the MTP results, a few different things have been modeled. The MTP scenario breaks up trips based on both what kind of vehicle is being driven (light vs. heavy duty, etc.) and where the trip is happening (internal to the county, inside the county to outside the county, etc.). These are used to adjust the VMT that is used in the LEAP model, providing a more accurate VMT than just using the state average. This affects the reporting from the LEAP model: Total energy consumption goes up, but a slightly higher percentage of total energy is from renewable sources.

Melanie asked if the LEAP model can provide energy use per capita, and Kate indicated that it could. This could be a good metric to report.

Will asked whether other countries with large pushes for renewables have decreased their total energy use. Kate will investigate.

Marshall asked why the 2015 baseline scenario and the 2050 reference have such similar energy usage. Kate and Dave explained that the LEAP model assumes efficiency gains even in the 2050 reference.

The LEAP model with the MTP scenario implemented shows that transportation energy use would decrease significantly in 2050 compared to the reference scenario.

Melanie stated that CCRPC will re-analyze town level data with these results and distribute it.

4. Review Municipal Comments on Local Known Constraints* (20 Minutes)

Bolton is concerned that the energy subcommittee decided to include steep slopes as possible constraints rather than known constraints. The reasoning was that ski lifts are allowed in these areas. The town does not agree that ski lifts are similar types of development to wind turbines because of the necessary access roads. The ski lifts in town have all been installed via helicopter to avoid these impacts. There have been extensive discussions between the town and RPC staff on this issue.

Melanie stated that we need to be able to demonstrate that we can meet our renewable energy targets, and currently we only have 3x the amount of prime developable areas to meet our high target and 8x the amount we need to meet our low target. However, Melanie said that there is more than enough solar potential in the municipality to meet their high generation targets.

Sharon said that the municipality will definitely be including the steep slopes as a local known constraint, and wanted to know whether this would be an issue because the regional plan’s policy would override the local plan in a project deemed to have a substantial regional impact. Regina explained that the plan’s definition of SRI only kicks in if there is a discrepancy based on the land use maps.

Catherine expressed her concern about whether allowing the steep slopes to be a known constraint is applying a lower level of scrutiny to Bolton’s regulations than we did for other municipalities.

Jim raised the question of whether a local constraint can be more restrictive than how it is designated in the regional plan. Melanie explained that CCRPC is aware that local plans will be different than the regional plan, and that the RPC’s current thinking is that municipalities can be more restrictive than the regional plan currently is as long as they
can still meet their target. Jim said that he would like to see more guidance how this will be addressed so that towns can be aware of it as they’re updating their municipal plans.

Melanie suggested that Bolton’s steep slopes (25% and up) should be included as a known constraint if Bolton is still able to meet their target. Sharon expressed her disappointment that the state has not given us a mechanism to count biomass production from forestry as Bolton’s contribution to regional energy.

Richmond is requesting local constraints. Most of the regulatory language in their zoning and plan is not specific enough to add constraints.

Williston’s zoning is very specific on steep slopes and they are requesting it to be a known constraint.

5. **Review Comments on the draft Energy Sections of the ECOS Plan** *(20 Minutes)*
   Melanie asked the committee whether the plan should include a discussion of the new sound rules for wind development. The committee decided not to. The committee decided to submit their comments on the rest of the public comments to staff via a Google doc.

6. **Municipal Generation Targets** *(20 minutes)*
   Please see the table which shows each municipality’s generation target compared to prime and base solar energy potential. Melanie explained that it is impossible for Essex Junction and Essex Town to meet their targets because targets are based on population and electricity use, and Global Foundries (formerly IBM) uses a huge amount of electricity. The Town and Village combined use 43% of the region’s electricity. The committee agreed that we should pull the electricity use of Global Foundries out of Essex and Essex Junction and distribute it across the region, so as not to penalize the town and village. Essex and Essex Junction combined used over 800,000,000 kWh in 2016, compared to the next highest user, Burlington, which used less than 340,000,000 kWh. The committee discussed extensively. The target might be set for Essex and Essex Junction combined.

7. **Next Steps**
   The next meeting 12/19/2017 and will run from 5pm-8pm. The meeting adjourned at 7:15pm.
Draft MTP Scenario

• Achieve ECOS Plan Goals:
  – Provide accessible, safe, efficient, interconnected, secure, equitable and sustainable mobility choices for our region’s businesses, residents and visitors.
  – Encourage future growth in the Center, Metro, Enterprise, Suburban, and Village Planning Areas to maintain Vermont’s historic settlement pattern and respect working and natural landscapes.

• Analyzed several scenarios to achieve best results

• Balance between:
  – Reducing congestion
  – Fixing high crash locations
  – Increasing livability by investing in areas planned for growth
Draft MTP Scenario

• All TIP Projects
• Third Lane on I-89 between Exits 14 and 15
• Exit 12B placeholder (14, 14N, other?)
  – Future I-89 Scoping Study (Exits 12 to 16?)
• ITS Investments
• Transit enhancements
  – 20 minute headways on all routes, every day
  – New Colchester loop
• Increases in walking/biking
• Land-use concentration
  – 90% of HH growth in areas planned for growth
- 2050 Base: 28% increase from 2015
- MTP Scenario: 24% increase from 2015
Countywide Daily Vehicle Miles Traveled (VMT) per Capita

- Draft MTP Scenario: 0.7 mile decrease from 2050 Base
Countywide Daily Transit, Walking & Biking Mode Split

- Draft MTP Scenario: 4% increase from 2050 Base
Agenda

- LEAP Energy Modeling Refresher
- Prior Chittenden County LEAP Analysis
- Metropolitan Transportation Plan Scenarios
- MTP LEAP Results
LEAP Methodology and Regionalization

– **Long-range Energy Alternatives Planning System**

– LEAP is an *accounting framework* that aggregates existing data and modeling efforts

– Well suited for creating “self-consistent story lines of how an energy system might evolve over time”.

– Strong tool for scenario modeling and regionalization

https://www.energycommunity.org/
How might we get to 90% Renewable by 2050?

Total Energy Study Results
Statewide fuel type, generation, consumption scenarios

Regional data
Population, employment, fuel availability and expected changes over time

Statewide totals
Aggregate and Balance Data

Demo-graphic data
Average home heating needs and fuel types
Average water heating use
State-wide commercial floor area
Vehicle miles traveled
Expected efficiency upgrades
Statewide renewable potential and grid needs
Key LEAP Parameters

• Transportation
  o Population, Per capita VMT, Vehicle efficiency/fuel

• Residential
  o Number of units, type of heating, electric efficiency

• Commercial
  o Based on Total Energy Study estimates apportioned by an estimate of square footage based on employees in the commercial sector in the region
Total Energy Consumption - Prior Scenarios

Excluding Aviation Fuel

- 2015 Reference: 19% Renewables, 81% Fossil Fuels
- 2050 Reference: 23% Renewables, 77% Fossil Fuels
- 2050 CCRPC 90x2050: 85% Renewables, 15% Fossil Fuels
- 2050 CCRPC GAS: 54% Renewables, 46% Fossil Fuels

Vermont Energy Investment Corporation
2050 MTP Updates – Types of Modeled Trips

Types of Trips

- Internal to Internal
- eXternal to Internal
- Internal to eXternal
- eXternal to Internal

CCRPC Model VMT Reporting

- HBW VMT
- HBO VMT
- NHB VMT
- L_COMM VMT
- M_COMM VMT
- H_COMM VMT
- IX Medium Truck VMT
- XI Medium Truck VMT
- IX Heavy Truck VMT
- XI Heavy Truck VMT
- IX Passenger VMT
- XI Passenger VMT
- XX Passenger VMT
- XX Medium Truck VMT
- XX Heavy Truck VMT

2015 Census LEHD Employment
Inflow/Outflow Analysis

[Map with arrows pointing to different types of trips and VMT reporting categories]
2050 MTP Updates – VMT per Vehicle

• Calculate CCRPC model’s percent change for Internal & Internal to External daily VMT per vehicle and apply to 2015 LEAP annual VMT per vehicle baseline

<table>
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<tr>
<th>LEAP Input Parameters</th>
<th>2015 Baseline</th>
<th>2050 Reference Scenario</th>
<th>2050 MTP Scenario</th>
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<td>Light Duty Vehicle Annual VMT per vehicle</td>
<td>9,631</td>
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<td>Heavy Duty Vehicle Annual VMT per vehicle</td>
<td>49,170</td>
<td>53,750</td>
<td>53,558</td>
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2050 MTP LEAP Scenario – Light Duty Fuel Transition

The diagram illustrates the projected share of vehicles using different fuels over the years 2015 to 2050. Key categories include:

- **Gasoline**
- **Electric**
- **Hydrogen**
- **Biodiesel**
- **Diesel**
- **Electricity**
- **Ethanol**

The percentage share of vehicles for each fuel type is expected to change significantly by 2050, with a notable increase in electric vehicles and a decrease in gasoline usage.
LEAP Total Energy Consumption – 2050 MTP

Excluding Aviation Fuel

- 2015 Baseline: 22% Renewables, 78% Fossil Fuels
- 2050 Reference: 27% Renewables, 73% Fossil Fuels
- 2050 MTP: 87% Renewables, 13% Fossil Fuels
Transportation Energy

Chittenden County Road Transportation Energy
Light and Heavy Duty Vehicle Travel

Energy (Trillion Btus)

2015 2025 2035 2050

2050 Reference 2050 MTP

Vermont Energy Investment Corporation
Next Steps

• Finalize MTP LEAP analysis
• Revise / finalize energy modeling report
• Implementation support
1=yes, 0=no

*Prime solar acres is going to decrease because of local constraints. Bolton, Williston, and Richmond will change because agreement on how constraints should be included as either known or possible constraints in the ECOS Plan has not been reached. Charlotte and Westford prime solar acreage will change due to a correction of a processing error. Towns with yellow highlight indicate that the prime solar acreage will change.

1. For Essex Junction, Burlington, and Winooski should we only report rooftop energy potential because of the urban/mostly developed nature of the municipality?

2. Essex Junction cannot meet its municipal target for renewable energy generation even when including base solar areas.

3. South Burlington can only meet its high range municipal target with the both prime and base solar areas.

### Table: 11/19/2017

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