

**ECE330: Power Circuits & Electromechanics**  
**Lecture 16. Energy conversion cycles**

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**Motor technology from Model 3 helps Tesla boost Model S range 10%**

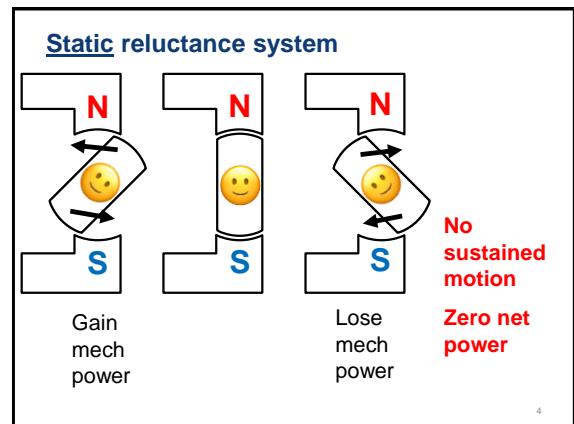
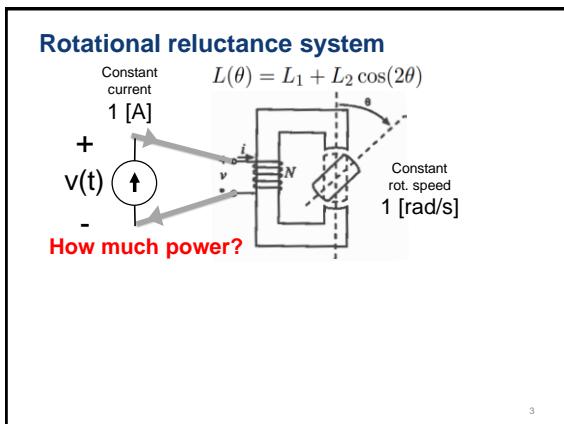
New motor design helps Model S to drive 370 miles on a charge.

The Model 3 debuted with an alternative motor technology that Tesla calls a permanent magnet synchronous reluctance motor. A synchronous reluctance motor has a series of electromagnets around the stator, but the rotor doesn't have any windings or permanent magnets. Instead, the rotor contains veins of a magnetic material interspersed with non-magnetic material, arranged so that it has a preferred orientation in the magnetic field created by the stator.

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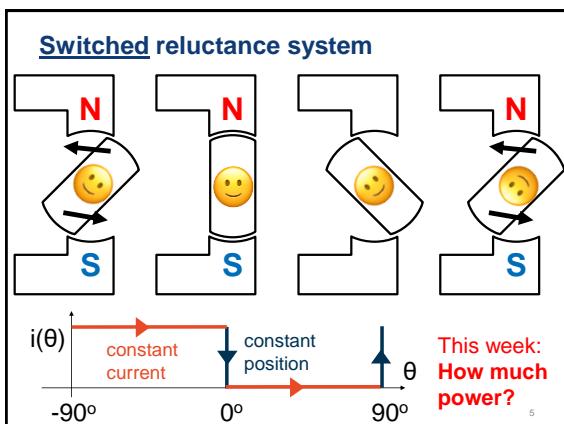
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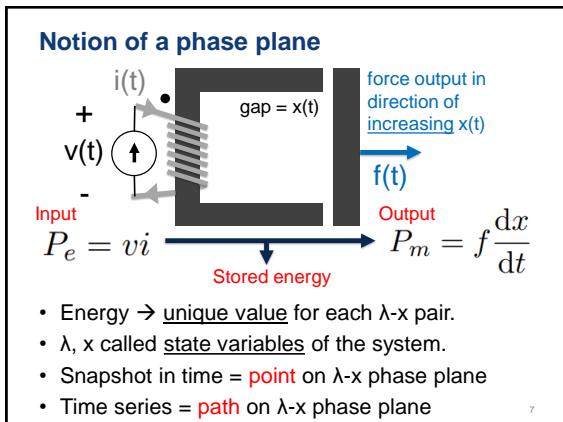
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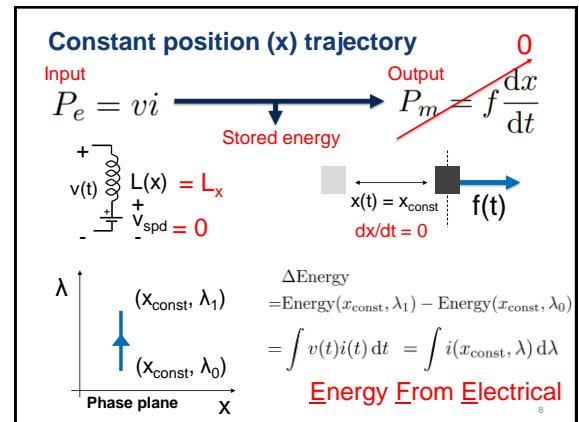
- Today**
- Trajectories on the  $\lambda$ - $x$  phase plane
  - Trajectories and force diagrams
  - Example: Switched reluctance machine
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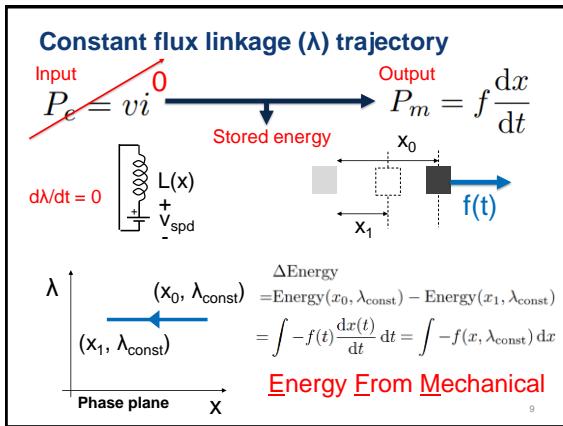
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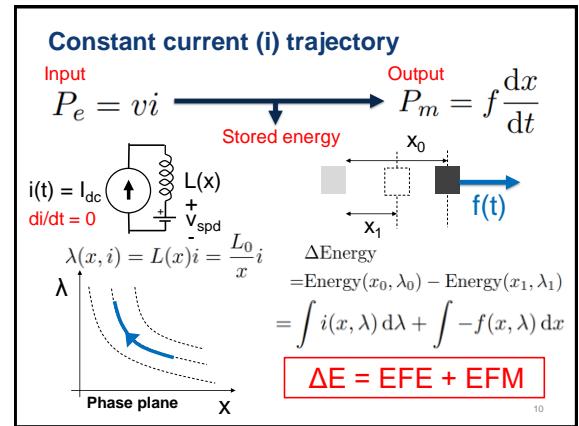
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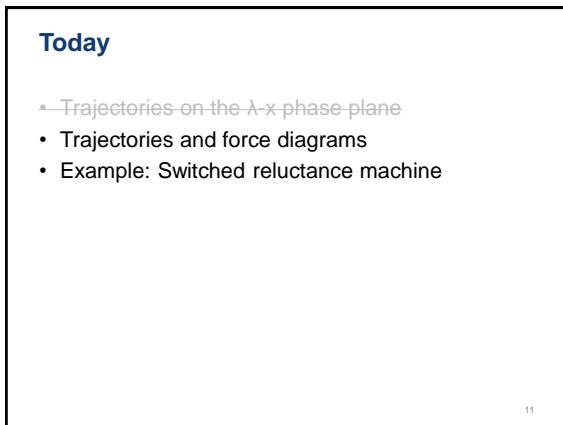
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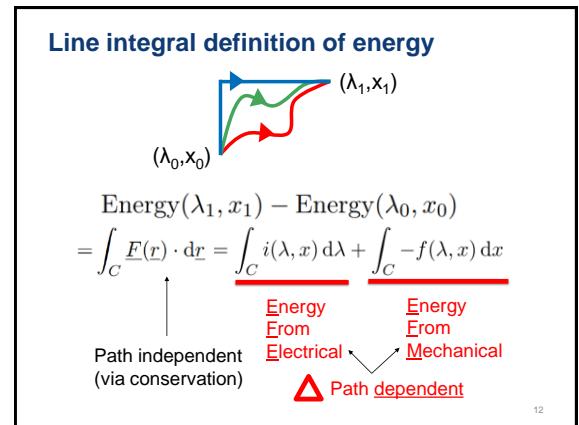
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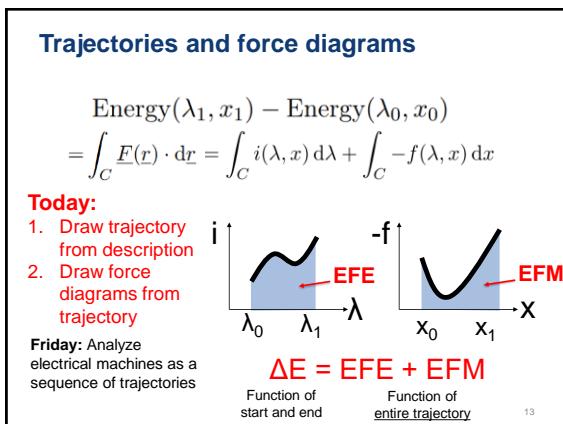
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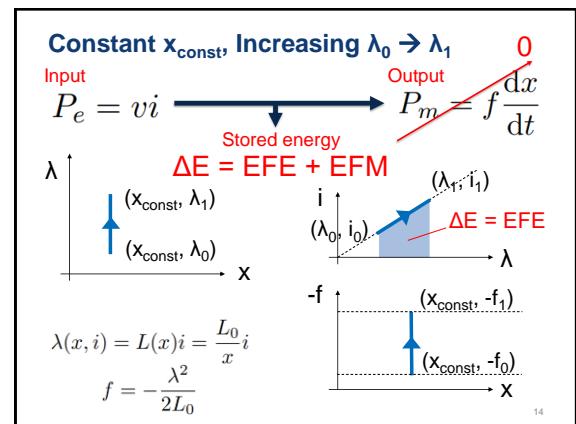
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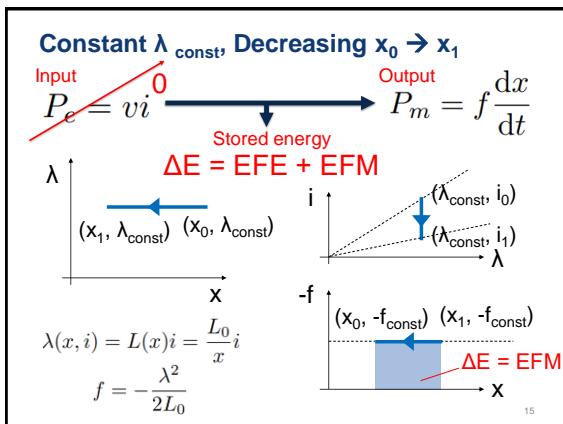
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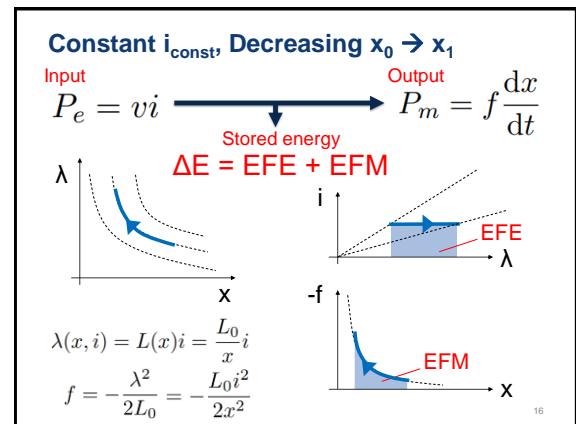
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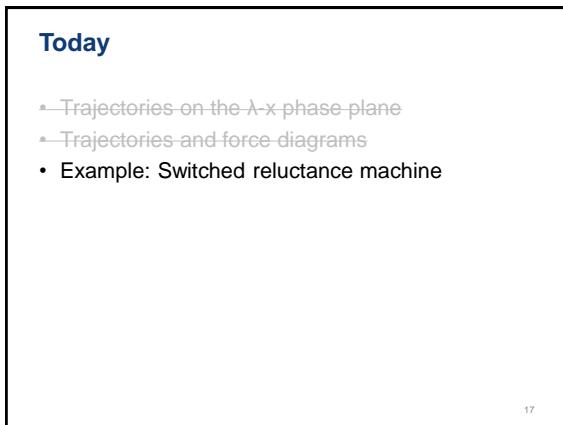
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