**Lazard LCOE***Links*

**Callout Text**

Text

* [Summary](https://www.lazard.com/perspective/lcoe2019/)
* [Full report – LCOE](https://www.lazard.com/media/451086/lazards-levelized-cost-of-energy-version-130-vf.pdf)
* [Full report – LCOS](https://www.lazard.com/media/451087/lazards-levelized-cost-of-storage-version-50-vf.pdf)

*Things to Cover*

* Focus/Purpose of study
* Key assumptions
* Conclusions / Outcome
* Critique (Positive / Negative)
* Biggest surprise / Something to discuss as a class

*Deliverable*

* One pager
* One PPT slide

**LCOE Calculation**

Source: <https://www.energy.gov/sites/prod/files/2015/08/f25/LCOE.pdf>

**LCOE equation**

: Life of the system (in # of years)

: Discount rate

: Investment expenditures in year

: Operations & Maintenance expenditures in year

: Fuel expenditures in year

: Subsidies

: Electricity generation in year

**Subsidies**

<https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf>

*Investment Tax Credit*

*Production Tax Credit*

*U.S. Tax Cuts and Jobs Act*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Increase** or **(Decrease)** in LCOE over given time frame | | |
|  | **Generation Tech**  (2019 LCOE in $/MWh in parentheses) | **3-year** | **5-year** | **10-year** |
| Conventional | Gas Peaker ($175) | (8%) | (15%) | (37%) |
| Nuclear ($155) | 5% | 38% | 26% |
| Coal ($109) | 7% | 0% | (2%) |
| Gas – Combined Cycle ($56) | (13%) | (24%) | (32%) |
| Renewable | Geothermal ($91) | (7%) | (22%) | 20% |
| Solar Thermal Tower ($141) | (7%) | 14% | (16%) |
| Solar PV – Crystalline ($40) | (27%) | (49%) | (89%) |
| Wind ($41) | (18%) | (32%) | (70%) |

**Assumptions**

Photosynthesis converts solar energy into chemical energy that is stored in and used by biological systems. This is the principal mechanism that has powered life on Earth for billions of years, and remains the source of almost all energy used by humanity.