

fluid after the fast transfer and allows the fast filling under very good efficiency. For comparison, the energy loss of the fast charge of an electrochemical battery has been analyzed. The original concept is dedicated to a delivery vehicle propelled by a compressed air motor. Prototype equipment is currently set in operation for a real application.

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References

- [1] Annual Energy Outlook 2011 with projections to 2035, US Energy Information Administration, DOE/EIA-0383 (2011) April 2011.
- [2] W. Kempton, J. Tomić, S. Letendre, A. Brooks, and T. Lipman, 2001, Vehicle-to-grid power: Battery, hybrid, and fuel cell vehicles as resources for distributed electric power in California [Online]. Available: <http://escholarship.org/uc/item/5cc9g0jp>
- [3] Dallinger, D.; Krampe, D.; Wietschel, M.; , Vehicle-to-Grid Regulation Reserves Based on a Dynamic Simulation of Mobility Behavior Smart Grid, IEEE Transactions on , Volume: 2 , Issue: 2 Digital Object Identifier: 10.1109/TSG.2011.2131692 Publication Year: 2011 , Page(s): 302 – 313
- [4] C. A. Ordonez, M. C. Plummer, R. F. Reidy "Cryogenic Heat Engines for Powering Zero Emission Vehicles", Proceedings of 2001 ASME International Mechanical Engineering Congress and Exposition, November 11–16, 2001, New York, NY
- [5] Fairley, P., Deflating the Air Car, IEEE Spectrum, November 2009
- [6] Höimoja H. et al. Towards Ultrafast Charging of Electrical Vehicles, 2012 CIGRE Session, Paris France, August 26-31 2012.
- [7] Alfred Rufer, Energy Storage – Systems and Components, CRC Press, Taylor and Francis Group, 2018, ISBN -13: 978-08262-5
- [8] Devin Serpa, Tank-to-wheel efficiency, After Oil EV, <https://fr.scribd.com/doc/31295002/EFF-Tank-to-Wheel>
- [9] A. Rufer, S. Lemofouet, M. Habisreutinger, A. Leuba, Driving and Filling Personal Vehicles – The Questions of Energy - and Power – Density, World Engineering Convention, Geneva, 4-9 September 2011
- [10] Vito Gianfranco Truglia, High-Efficiency Engine Driven by Pressurized Air or Other Compressible Gases, Patent Application US 2012/0318133 A1, Dec. 20, 2012
- [11] Vishwajeet Singh, Compressed air engine, International Journal of Scientific and Research Publications, Vol. 7 Issue 7, July 2017, ISSN 2250-3153
- [12] <https://www.youtube.com/watch?v=u0c7IIDFsYA>

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