

Title (en)
Method and system for energy storing and short-term power generation

Title (de)
Verfahren und System zum Energiespeichern und Kurzzeitstromerzeugung

Title (fr)
Procédé et système de stockage d'énergie et génération de puissance à court terme

Publication
EP 2703610 A1 20140305 (EN)

Application
EP 12182561 A 20120831

Priority
EP 12182561 A 20120831

Abstract (en)
In a method for energy storing and short-term power generation, an intermediate storage of a CCS system is used to store the working fluid of a CO₂ based Rankine process. Liquid CO₂ is stored in an underground reservoir (10) arranged to continually receive liquid CO₂ at a first temperature from one or more CO₂ capture sites and to discharge liquid CO₂ to be transported to a final storage. The underground reservoir (10) is kept at a pressure of 8 - 10 bar. When short-term power generation is needed, liquid CO₂ is withdrawn from the underground reservoir (10), pressurized to about 40 - 50 bar, evaporated with the help of a low value heat source, and expanded in an expander turbine (13), which is connected to a generator (14). The expanded CO₂ is then condensed and returned to the underground reservoir (10) at a second temperature which is higher than the first temperature. When short-term power generation is no more needed, liquid CO₂ from the underground reservoir (10) is circulated through a heat pump (23) to cool the CO₂ until its temperature reaches the first temperature.

IPC 8 full level
F01K 25/10 (2006.01)

CPC (source: EP)
F01K 25/103 (2013.01)

Citation (applicant)
• US 2012001429 A1 20120105 - SAAR MARTIN O [US], et al
• EP 0277777 A2 19880810 - CBI RES CORP [US]
• US 4995234 A 19910226 - KOOY RICHARD J [US], et al

Citation (search report)
• [A] US 4995234 A 19910226 - KOOY RICHARD J [US], et al
• [A] EP 0277777 A2 19880810 - CBI RES CORP [US]
• [A] US 2012001429 A1 20120105 - SAAR MARTIN O [US], et al

Cited by
CN104454054A; NL1043180B1; CN106968737A; CN114320504A; DE102020000131A1; WO2016144197A1; WO2021139846A1;
DE102020000131B4; WO2022010344A1

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Designated extension state (EPC)
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EP 2703610 A1 20140305; EP 2703610 B1 20150617; CN 104603403 A 20150506; CN 104603403 B 20170510; PL 2703610 T3 20160129;
WO 2014033206 A1 20140306

DOCDB simple family (application)
EP 12182561 A 20120831; CN 201380045356 A 20130829; EP 2013067884 W 20130829; PL 12182561 T 20120831