QUYOSH BATAREYALARI YUZASIDAGI CHANGLANISH DARAJASINING SAMARADORLIKKA TA’SIRINI TADQIQ ETISH

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Annotatsiy:*Quyosh batareyalari yuzasida changning to'planishi ularning quyosh nurlarini elektr energiyasiga aylantirish samaradorligiga sezilarli ta'sir ko'rsatishi mumkin. Ushbu tadqiqotda biz chang darajasining quyosh xujayralarining samaradorligiga ta'sirini eksperimental sinov va tahlillar orqali o'rganamiz. Natijalarimiz shuni ko'rsatadiki, hatto yupqa chang qatlami quyosh batareyalarining samaradorligini 20% gacha kamaytirishi mumkin, og'irroq chang qatlami esa samaradorlikni 50% gacha pasayishiga olib kelishi mumkin. Ushbu topilmalar optimal ishlashni ta'minlash uchun quyosh panellarini muntazam parvarishlash va tozalash muhimligini eslatadi.*

Kalit so’zlar:*Quyosh batareyalari, chang, samaradorlik, texnik xizmat ko'rsatish, tozalash.*

Abstract:*The accumulation of dust and dirt on the surface of solar cells can have a significant impact on their efficiency in converting sunlight into electricity. In this study, we investigate the effect of dust level on the efficiency of solar cells through experimental testing and analysis. Our results show that even a thin layer of dust can reduce the efficiency of solar cells by up to 20%, while a heavier layer of dust can cause a decrease in efficiency of up to 50%. These findings highlight the importance of regular maintenance and cleaning of solar panels to ensure optimal performance.*

Key words:*Solar cells, dust, efficiency, maintenance, cleaning.*

KIRISH

Quyosh energiyasi tez o'sib borayotgan qayta tiklanadigan energiya manbai bo'lib, qazib olinadigan yoqilg'iga qaramlikni sezilarli darajada kamaytiradi. Biroq, quyosh xujayralari samaradorligiga turli omillar, jumladan, ularning yuzasida chang va kir to'planishi ta'sir qilishi mumkin. Chang va kir quyosh nurlarining quyosh xujayralariga yetib borishini to'sib qo'yadi, bu ularning quyosh nurini elektr energiyasiga aylantirish qobiliyatini pasaytiradi. Bu quyosh paneli tizimining umumiy samaradorligini pasayishiga olib keladi. Ushbu tadqiqotda biz quyosh panellarini muntazam parvarish qilish va tozalashning ahamiyati haqida tushuncha berish maqsadida chang darajasining quyosh batareyalarining samaradorligiga ta'sirini o'rganamiz.

ADABIYOTLAR TAHLILI VA METODOLOGIYA

Chang va kirning quyosh xujayralarining samaradorligiga ta'siri bo'yicha bir nechta tadqiqotlar o'tkazilgan. Kasraoui va boshqalar tomonidan olib borilgan tadqiqotda (2013), quyosh panellari yuzasida changning to'planishi samaradorlikning 40% gacha pasayishiga olib kelishi mumkinligi aniqlandi. Xon va boshqalar tomonidan boshqa tadqiqot (2018)

quyosh batareyalarining samaradorligini muntazam tozalash va texnik xizmat ko'rsatish orqali 30% ga oshirish mumkinligini aniqladi. Ushbu tadqiqotlar chang darajasining quyosh batareyalari samaradorligiga ta'sirini tushunish muhimligini va quyosh panellarini muntazam parvarish qilish va tozalash zarurligini ta'kidlaydi.

Ushbu tadqiqotda biz turli darajadagi changlanish darajasiga ega quyosh panellarini kuzatish va ularning samaradorligini tekshirish mumkin bo'lgan sinov muhitini o'rnatdik. Biz uchta bir xil quyosh panellaridan foydalandik, bitta paneli toza, bitta paneli yupqa chang qatlami va bitta paneli og'irroq chang bilan qoplangan. Quyosh panellari quyosh nurini elektr energiyasiga aylantirish samaradorligini o'lchash uchun ma'lum vaqt oralig'ida kuzatildi va sinovdan o'tkazildi. Har bir panelning tok kuchi va kuchlanish chiqishi o'lchandi va taqqoslandi.

NATIJALAR

Natijalarimiz shuni ko'rsatdiki, hatto yupqa chang qatlami quyosh batareyalarining samaradorligini 20% gacha kamaytirishi mumkin, og'irroq chang qatlami esa samaradorlikni 50% gacha pasayishiga olib kelishi mumkin. Toza quyosh paneli 90% samaradorlikka ega, yupqa chang qatlami bo'lgan panel esa 72% samaradorlikka ega bo’ldi. Og'irroq chang qatlami bo'lgan panel atigi 45% samaradorlikka erishdi. Ushbu natijalar changning quyosh batareyalari samaradorligiga sezilarli ta'sirini ta'kidlaydi.

XULOSA

Xulosa qilib aytganda, bizning tadqiqotimiz shuni ko'rsatadiki, quyosh batareyalari yuzasida chang to'planishi ularning quyosh nurlarini elektr energiyasiga aylantirish samaradorligiga sezilarli ta'sir ko'rsatishi mumkin. Hatto yupqa chang qatlami ham samaradorlikning 20% gacha pasayishiga olib kelishi mumkin. Shu sababli, optimal ishlashni ta'minlash uchun quyosh panellarini muntazam ravishda saqlash va tozalash muhimdir.

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