

# SHAMOL VA QUYOSH ELEKTR STANSIYALARINI GIBRID TIZIM SIFATIDA BIRGALIKDA FOYDALANISH UCHUN KONTROLLERDAN FOYDALANISH

Ahmedov Usmonjon Mo'minjon o'g'li

Islom Karimov nomidagi Toshkent davlat texnika universiteti,

Universitet shaxarchasi 2-uy, Tashkent 100095, O'zbekiston

Toshkent amaliy fanlar universiteti, Gavhar ko'chasi 1 -uy, Tashkent 100149, O'zbekiston

usmonjonaxmedov1993@gmail.com

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**Annotatsiya:** Quyosh va shamol elektr stansiyalaridan birgalikda foydalanish mumkin. Quyosh panellarining zaif tomonlari bor, ya'ni yomg'irli yoki bulutli ob-havo sharoitlarida ishlab chiqarayotgan elektr energiyasi kamayadi. Shamol generatorlari uchun esa doimiy esadigan shamol mavjud bo'lishi kerak. Shunday qilib ularni birlashtirish orqali barqaror tizim sifatida foydalanishimiz mumkin, bu odatda gibrid tizim deb ataladi.

**Kalit so'zlar:** Quyosh panellari, shamol generatori, gibrid, kontroller, birgalikda.

## 1 KIRISH

Organik yoqilg'i zaxiralarning cheklanganligi, ekologik vaziyatning borgan sari yomonlashib borayotgani va shu o'rinda elektr energiyasiga bo'lgan ehtiyoj ortib borayotgani qayta tiklanadigan energiya manbalaridan, xususan shamol va quyosh energiyasidan foydalanishni taqozo etmoqda. O'zbekistonda qayta tiklanadigan energiya, jumladan shamol va quyosh energiyasi potentsiali yuqori xisoblanadi.

Quyosh va shamol energiyasidan foydalanish mumkin bo'lgan muqobil energiya manbai xisoblanadi. Quyosh va shamol energiyasi manbalaridan barqaror foydalanish mumkin. Bundan tashqari, quyosh energiyasi manbalari doimiy ravishda elektr energiyasini ta'minlashi mumkin, chunki energiya manbai qayta tiklanadigan energiya manbai bo'lib, ekologik toza energiya hisoblanadi, shuningdek issiqxona gazlari chiqindilarini kamaytiradi. O'zbekistonning tog' va tog' oldi hududlarida shamol tezligi nisbatan yuqori va u doimiy esib turadi, shuning uchun ko'plab hududlar shamol elektr stansiyasi o'rnatish va rivojlantirish uchun mos keladi. Shuning uchun tadqiqotchilar quyosh va shamol energiyasidan muqobil energiya manbalarini o'rganishga qiziqishmoqda.

Quyosh energiyasi va shamol energiyasi zaif tomoni, ya'ni yomg'irli yoki bulutli mavsumda ishlab chiqarilgan

energiya katta emas, shuning uchun bu muammoni bartaraf etish uchun alternativani topish kerak. Buning bir usuli odatda gibrid tizim deb ataladigan ikkita energiya manbasini birlashtirish. Maqsadi gibrid texnologiyani ishlab chiqish ixcham tizim sifatida integratsiyalashgan holda ishlaydigan ikki yoki undan ortiq ishlab chiqaruvchi manbalarni birlashtirish orqali yanada samarali elektr stansiyasini olishdir [4]. Shunday qilib, agar bitta energiya manbai energiya ishlab chiqara olmasa, boshqa energiya manbai uni yukni energiya etkazib beruvchisi sifatida almashtiradi.

## 2 TADVIQOT METODOLOGIYASI

Gibrid elektr stansiyalari quyosh energiyasi va shamol energiyasidan foydalangan holda ishlab chiqariladi. Quyosh energiyasidan quyosh xujayrasi yordamida, shamol energiyasi uchun esa turbinali generator yordamida foydalanish. Ishlab chiqarilgan elektr energiyasining ikki turi -bu quyosh batareyalaridan olinadigan elektr energiyasi, shuningdek, ushbu turbina generatoridan olinadigan elektr energiyasi, keyinchalik gibrid tizimda energiya ishlab chiqarish uchun ishlatiladi. Shamol va quyosh elektr stansiyasilar alohida qilingan bo'lsa ham, elektr stansiyasilar bitta kontroller bilan bog'langan. Ushbu kontroller 1-rasmda keltirilgan.



1-rasm: Shamol va quyosh elektr stansiyalaridan gibriz tizim sifatida foydalanish uchun kontroller

Kontroller gibriz elektr stantsiya uchun zarur bo'lgan bir nechta funksiyalarni bajara oladi jumladan, akkumulyator batareyasini zaryadlash, quyosh zaryadlovchi boshqaruvchisi (Solar Charger Controller), shamol turbinasi boshqaruvchisi (Wind Turbine Controller) va inverter.

### 3 MAVZUGA OID ADABIYOTLAR TAHLILI

Qayta tiklanuvchi energiya manbalaridan alohida va kombinatsion foydalanish Xu Lin.

Quyosh-shamol gibriz tizimlarida qo'llaniladigan energetik qurilmalar ish rejimlari Ruan Xinbo.

Quyosh-shamol gibriz tizimlarini parametrlarini tanlash hamda simulyatsiyali tahlil qilish M. Ahmadi, M. Senbagan, A. P Ostashenkov, M.M. Axmed

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Quyosh va shamol energiyasidan foydalanadigan gibriz elektr stantsiyasidan ishlab chiqarilgan energiya doimiy elektr energiyasidir. Quyosh panellari bulutli ob-havo sharoitlarida elektr energiya ishlab chiqarish ochiq ob-havo sharoitlariga qaraganda kamroqdir, lekin gibriz tizimda shamol generatori shamolning eng past tezliklarida ham elektr energiya ishlab chiqarish barqarorligicha qoladi.

### XULOSA

Elektr energiya iste'molchilarini uzluksiz elektr energiya ta'minlash maqsadida shamol va quyosh elektr stansiyalarini birgalikda gibriz tizim sifatida foydalanish va ushbu gibriz tizimda maxsus kontrollerdan foydalanish orqali tizimning yanada ishonchliligini oshiradi

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