SQL Queries:

JOIN Queries:

1-Top 10 countries having maximum Renewable Energy Generation:

```
SELECT CC.idCountryAndCode, CC.CountryName, CC.Area, REG.EnergyGeneration FROM
`DMDDWorldEnergy`.`Domain_CountryAndCode` AS CC INNER JOIN
`DMDDWorldEnergy`.`Domain_RenewableEnergyGeneration` AS REG ON CC.idCountryAndCode =
REG.idRenewableEnergyGeneration ORDER BY REG.EnergyGeneration DESC LIMIT 10;
```

2-Maximum User of Renewable & Primary Energy around the Globe:

```
SELECT CO.CountryName, CC.RECBFCountryId, CC.SolarConsumption,
CC.WindConsumption,CC.GeoBioMassConsumption, REC.CoalConsumption, REC.OilConsumption,
REC.GasConsumption from `DMDDWorldEnergy`.`Domain_RenewableEnergyConsumptionByFuel`

AS CC INNER JOIN `DMDDWorldEnergy`.`Domain_PrimaryEnergyConsumptionByFuel` AS REC
ON CC.RECBFCountryId = REC.PECBCountryID INNER JOIN
`DMDDWorldEnergy`.`Domain_CountryAndCode` AS CO ON CO.idCountryAndCode = CC.RECBFCountryId
ORDER BY REC.CoalConsumption DESC;
```

3-The geographical region with the maximum number of Wind Energy Consumers in the world:

```
SELECT CC.idCountryAndCode, CC.CountryName, CC.Area, REG.WindConsumption FROM
`DMDDWorldEnergy`.`Domain_CountryAndCode`
AS CC INNER JOIN `DMDDWorldEnergy`.`Domain_RenewableEnergyConsumptionByFuel` AS REG ON
CC.idCountryAndCode =
REG.idRenewableEnergyConsumptionByFuelType ORDER BY REG.WindConsumption DESC LIMIT 10
```

4 - The Global coal consumer with the exajoule of coal consumption:

```
SELECT CC.idCountryAndCode, CC.CountryName, CC.Area, REG.CoalConsumption FROM
`DMDDWorldEnergy`.`Domain_CountryAndCode`
AS CC INNER JOIN `DMDDWorldEnergy`.`Domain_PrimaryEnergyConsumptionByFuel` AS REG ON
CC.idCountryAndCode =
REG.idPrimaryEnergyConsumptionByFuel ORDER BY REG.CoalConsumption DESC LIMIT 10
```

5- Total CO2 Emission for the Year 2021 by all the countries:

```
SELECT CC.idCountryAndCode, CC.CountryName, CC.Area, CO2.CO2Emission FROM
`DMDDWorldEnergy`.`Domain_CountryAndCode`
AS CC INNER JOIN `DMDDWorldEnergy`.`Domain_CO2Emission` AS CO2 ON CC.idCountryAndCode =
CO2.idCO2EmissionDomain ORDER BY CO2.CO2Emission DESC
```

SQL Statements for the conceptual model:

Database Connection:

```
database = MySQLdb.connect (host="localhost" , user="root" ,
password="root" ,db="DMDDWorldEnergy")
cursor = database.cursor()
```

WorldEnergy Tables(Twitter Scrapped Data):

1- **For WindEnergy**

```
"CREATE TABLE IF NOT EXISTS `DMDDWorldEnergy`.` WorldOnWindEnergy`
(`UserName` VARCHAR(45) NULL,`UserCreatedAt` VARCHAR(45)
NULL,`Description` VARCHAR(400) NULL,`TweetCreatedAt` VARCHAR(100)
NULL,`Location` VARCHAR(100) NULL,`Tweet` VARCHAR(5000) NULL)"
```

2- For SolarEnergy

```
"CREATE TABLE IF NOT EXISTS `DMDDWorldEnergy`.`WorldOnSolarEnergy`
(`UserName` VARCHAR(45) NULL,`UserCreatedAt` VARCHAR(45)
NULL,`Description` VARCHAR(400) NULL,`TweetCreatedAt` VARCHAR(100)
NULL,`Location` VARCHAR(100) NULL,`Tweet` VARCHAR(500) NULL)"
```

3- For RenewableEnergy

```
"CREATE TABLE IF NOT EXISTS `DMDDWorldEnergy`.`WorldOnRenewableEnergy`
(`UserName` VARCHAR(45) NULL,`UserCreatedAt` VARCHAR(45)
NULL,`Description` VARCHAR(400) NULL,`TweetCreatedAt` VARCHAR(100)
NULL,`Location` VARCHAR(100) NULL,`Tweet` VARCHAR(5000) NULL)"
```

4- For CO2Emission

```
cO2Emission = "CREATE TABLE IF NOT EXISTS `DMDDWorldEnergy`.`CO2Emission`
(`UserName` VARCHAR(45) NULL,`UserCreatedAt` VARCHAR(45)
NULL,`Description` VARCHAR(400) NULL,`TweetCreatedAt` VARCHAR(100)
NULL,`Location` VARCHAR(100) NULL,`Tweet` VARCHAR(5000) NULL)"
```

5- For Renewable Energy

```
"CREATE TABLE IF NOT EXISTS `DMDDWorldEnergy`.`WorldOnRenewableEnergy`
(`UserName` VARCHAR(45) NULL,`UserCreatedAt` VARCHAR(45)
NULL,`Description` VARCHAR(400) NULL,`TweetCreatedAt` VARCHAR(100)
NULL,`Location` VARCHAR(100) NULL,`Tweet` VARCHAR(5000) NULL)"
```

DOMAIN TABLES:

```
CREATE TABLE `Domain_RenewableEnergyConsumptionByFuelType` (
  `idRenewableEnergyConsumptionByFuelType` int NOT NULL,
  `FuelID` varchar(45) NOT NULL,
  `Consumption` varchar(45) NOT NULL,
  PRIMARY KEY (`idRenewableEnergyConsumptionByFuelType`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;


CREATE TABLE `Domain_CO2Emission` (
  `idCO2EmissionDomain` int NOT NULL,
 `CountryID` varchar(45) NOT NULL,
  `CO2Emission` varchar(45) NOT NULL,
  PRIMARY KEY (`idCO2EmissionDomain`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;


CREATE TABLE `Domain_CountryAndCode` (
  `idCountryAndCode` int NOT NULL AUTO_INCREMENT,
  `CountryName` varchar(45) NOT NULL,
  `Area` varchar(45) NOT NULL,
  PRIMARY KEY (`idCountryAndCode`)
 ENGINE=InnoDB AUTO_INCREMENT=29 DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_0900_ai_ci;



CREATE TABLE `Domain_PrimaryEnergyConsumption` (
  `idPrimaryEnergyConsumption` int NOT NULL,
  `CountryId` varchar(45) DEFAULT NULL,
  `Consumption` varchar(45) DEFAULT NULL,
  PRIMARY KEY (`idPrimaryEnergyConsumption`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;

CREATE TABLE `Domain_PrimaryEnergyConsumption` (
  `idPrimaryEnergyConsumption` int NOT NULL,
  `CountryId` varchar(45) DEFAULT NULL,
  `Consumption` varchar(45) DEFAULT NULL,
  PRIMARY KEY (`idPrimaryEnergyConsumption`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;

CREATE TABLE `Domain_PrimaryEnergyConsumptionPerCapita` (
```

```
  `idPrimaryEnergyConsumptionPerCapita` int NOT NULL,
  `CountryID` varchar(45) NOT NULL,
  `FuelID` varchar(45) NOT NULL,
  `Consumption` varchar(45) NOT NULL,
  PRIMARY KEY (`idPrimaryEnergyConsumptionPerCapita`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;


CREATE TABLE `Domain_RenewableEnergyConsumption` (
  `idRenewableEnergyConsumption` int NOT NULL,
  `CountryID` varchar(45) NOT NULL,
  `EnergyConsumption` varchar(45) NOT NULL,
  PRIMARY KEY (`idRenewableEnergyConsumption`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;


CREATE TABLE `Domain_RenewableEnergyConsumptionByFuelType` (
  `idRenewableEnergyConsumptionByFuelType` int NOT NULL,
  `FuelID` varchar(45) NOT NULL,
  `Consumption` varchar(45) NOT NULL,
  PRIMARY KEY (`idRenewableEnergyConsumptionByFuelType`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;

CREATE TABLE `Domain_RenewableEnergyGeneration` (
  `idRenewableEnergyGeneration` int NOT NULL,
  `CountryID` varchar(45) NOT NULL,
  `EnergyGeneration` varchar(45) NOT NULL,
  PRIMARY KEY (`idRenewableEnergyGeneration`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
```

Constraint for Tweet table:

```
ALTER TABLE `DMDDWorldEnergy`.`Domain_CO2Emission`
ADD INDEX `LocationID_idx` (`CountryID` ASC) VISIBLE;
;
ALTER TABLE `DMDDWorldEnergy`.`Domain_CO2Emission`
ADD CONSTRAINT `LocationID`
  FOREIGN KEY (`CountryID`)
  REFERENCES `DMDDWorldEnergy`.`Domain_CountryAndCode` (`CountryName`)
  ON DELETE NO ACTION
  ON UPDATE NO ACTION;
```

```
ALTER TABLE `DMDDWorldEnergy`.`WorldOnEnergy`
ADD INDEX `LocationID_idx` (`CountryID` ASC) VISIBLE;
;
ALTER TABLE `DMDDWorldEnergy`.`Domain_CO2Emission`
ADD CONSTRAINT `LocationID`
  FOREIGN KEY (`CountryID`)
  REFERENCES `DMDDWorldEnergy`.`Domain_CountryAndCode` (`CountryName`)
  ON DELETE NO ACTION
  ON UPDATE NO ACTION;
```

```
ALTER TABLE `DMDDWorldEnergy`.`WorldOnSolarEnergy`
ADD INDEX `LocationID_idx` (`CountryID` ASC) VISIBLE;
;
ALTER TABLE `DMDDWorldEnergy`.`Domain_CO2Emission`
ADD CONSTRAINT `LocationID`
  FOREIGN KEY (`CountryID`)
  REFERENCES `DMDDWorldEnergy`.`Domain_CountryAndCode` (`CountryName`)
  ON DELETE NO ACTION
  ON UPDATE NO ACTION;
```

```
ALTER TABLE `DMDDWorldEnergy`.` CO2Emission`
ADD INDEX `LocationID_idx` (`CountryID` ASC) VISIBLE;
```

```
;
ALTER TABLE `DMDDWorldEnergy`.`Domain_CO2Emission`
ADD CONSTRAINT `LocationID`
  FOREIGN KEY (`CountryID`)
  REFERENCES `DMDDWorldEnergy`.`Domain_CountryAndCode` (`CountryName`)
  ON DELETE NO ACTION
  ON UPDATE NO ACTION;



ALTER TABLE `DMDDWorldEnergy`.`WorldOnRenewableEnergy\`
ADD INDEX `LocationID_idx` (`CountryID` ASC) VISIBLE;
;
ALTER TABLE `DMDDWorldEnergy`.`Domain_CO2Emission`
ADD CONSTRAINT `LocationID`
  FOREIGN KEY (`CountryID`)
  REFERENCES `DMDDWorldEnergy`.`Domain_CountryAndCode` (`CountryName`)
  ON DELETE NO ACTION
  ON UPDATE NO ACTION;
```

SQL Queries for Use Cases:

1: **The top 10 primary energy consumers of the world**

```
INSERT INTO `DMDDWorldEnergy`.`Domain_PrimaryEnergyConsumption`
(`CountryId`,
`Consumption`)
VALUES
<{1: }>,
<{100joules: }>);
```

```
SELECT CC.idCountryAndCode, CC.CountryName, CC.Area, PE.Consumption FROM
`DMDDWorldEnergy`.`Domain_CountryAndCode` AS CC INNER JOIN
`DMDDWorldEnergy`.`Domain_PrimaryEnergyConsumption` AS PE
 ON CC.idCountryAndCode = PE.idPrimaryEnergyConsumption ORDER BY PE.Consumption DESC
LIMIT 10;
```

2: The country stands on top for the usage of renewable energy

```
INSERT INTO `DMDDWorldEnergy`.`Domain_RenewableEnergyConsumption`
(`
`CountryID`,
`EnergyConsumption`)
VALUES
(<{1 }>,
<{875joules: }>);
```

```
SELECT CC.idCountryAndCode, CC.CountryName, CC.Area, RE.EnergyConsumption FROM
`DMDDWorldEnergy`.`Domain_CountryAndCode` AS CC INNER JOIN
`DMDDWorldEnergy`.`Domain_RenewableEnergyConsumption` AS RE
ON CC.idCountryAndCode = RE.idRenewableEnergyConsumption ORDER BY RE.EnergyConsumption
DESC LIMIT 1;
```

3: Total percentage of Renewables Energy consumption in the USA

```
INSERT INTO `DMDDWorldEnergy`.`Domain_RenewableEnergyConsumption`(`
`CountryID`,`EnergyConsumption`) VALUES (<{3}>,<{900joules:}>);
```

```
SELECT Consumption AS USConsumption FROM
DMDDWorldEnergy.Domain_PrimaryEnergyConsumption WHERE idPrimaryEnergyConsumption = 3;
SELECT SUM(Consumption) as Total FROM DMDDWorldEnergy.Domain_PrimaryEnergyConsumption ;
USConsumption/Total*100 as percentage;
```

4: Country with maximum users talking and tweeting on CO2 Emission

```
"INSERT INTO `DMDDWorldEnergy`.`CO2Emission`
(`UserName`,`UserCreatedAt`,`Description`,`TweetCreatedAt`,`Location`,`Tweet`) VALUES
(%s,%s,%s,%s,%s,%s)";

SELECT LOCATION FROM DMDDWorldEnergy.CO2Emission where TWEET  LIKE '%CO2%';
```

5: Locations of users talking most about Solar and Wind Energy

```
insert_query = "INSERT INTO `DMDDWorldEnergy`.`WorldOnSolarEnergy`
(`UserName`,`UserCreatedAt`,`Description`,`TweetCreatedAt`,`Location`,`Tweet`) VALUES
(%s,%s,%s,%s,%s,%s)"

insert_query = "INSERT INTO `DMDDWorldEnergy`.`WorldOnWindEnergy`
(`UserName`,`UserCreatedAt`,`Description`,`TweetCreatedAt`,`Location`,`Tweet`) VALUES
(%s,%s,%s,%s,%s,%s)"

SELECT * FROM `DMDDWorldEnergy`.`WorldOnSolarEnergy`

LEFT JOIN `DMDDWorldEnergy`.`WorldOnWindEnergy`  ON
`DMDDWorldEnergy`.`WorldOnSolarEnergy`.Location =
`DMDDWorldEnergy`.`WorldOnWindEnergy`.LOCATION

UNION

SELECT * FROM `DMDDWorldEnergy`.`WorldOnSolarEnergy`

RIGHT JOIN `DMDDWorldEnergy`.`WorldOnWindEnergy` ON
`DMDDWorldEnergy`.`WorldOnSolarEnergy`.Location =
`DMDDWorldEnergy`.`WorldOnWindEnergy`.LOCATION
```