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LAMPIRAN

1. Data Beban Harian Residensial, Fasilitas kesehatan, dan Fasilitas umum

Jam	Residensial kW	Faskes kW	Fashum kW	Total kW
0:00	113.96	4.68	1.36	120.00
1:00	104.46	4.29	1.25	110.00
2:00	96.87	3.98	1.16	102.00
3:00	93.07	3.82	1.11	98.00
4:00	118.71	4.87	1.42	125.00
5:00	113.96	4.68	1.36	120.00
6:00	96.48	3.96	1.15	101.59
7:00	149.71	4.10	1.19	155.00
8:00	144.72	3.96	1.44	150.12
9:00	139.78	3.82	1.39	145.00
10:00	142.68	3.90	1.42	148.00
11:00	146.53	4.01	1.46	152.00
12:00	147.50	4.04	1.47	153.00
13:00	144.72	3.96	1.44	150.12
14:00	139.78	3.82	1.39	145.00
15:00	125.32	3.43	1.25	130.00
16:00	217.08	3.96	1.15	222.19
17:00	224.71	4.10	1.19	230.00
18:00	229.59	4.19	1.22	235.00
19:00	222.75	4.06	1.18	228.00
20:00	219.82	4.01	1.17	225.00
21:00	217.87	3.97	1.16	223.00
22:00	214.94	3.92	1.14	220.00
23:00	142.45	5.85	1.70	150.00

2. Data Kecepatan angin desa Rongi

Minggu Tanggal 07-03-2021

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
0:30	6	
1:00	6	
1:30	5	
2:00	7	
2:30	6	
3:00	4	
3:30	5	
4:00	6	
4:30	4	
5:00	6	
5:30	5	
6:00	6	
6:30	5	
7:00	7	
7:30	7	
8:00	6	
8:30	8	
9:00	8	
9:30	9	
10:00	5	6.9583
10:30	7	
11:00	8	
11:30	8	
12:00	9	
12:30	8	
13:00	9	
13:30	10	
14:00	14	
14:30	10	
15:00	11	
15:30	9	
16:00	6	
16:30	7	
17:00	6	
17:30	6	
18:00	5	
18:30	4	
19:00	9	
19:30	5	

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
20:00	4	
20:30	8	
21:00	8	
21:30	6	
22:00	9	
22:30	9	
23:00	5	
23:30	6	
0:00	7	

Senin Tanggal 08-03-2021

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
0:30	6	
1:00	7	
1:30	7	
2:00	6	
2:30	6	
3:00	8	
3:30	6	
4:00	9	
4:30	6	
5:00	6	
5:30	5	
6:00	7	
6:30	8	
7:00	8	
7:30	8	8.4166
8:00	11	
8:30	11	
9:00	10	
9:30	10	
10:00	11	
10:30	11	
11:00	9	
11:30	8	
12:00	11	
12:30	11	
13:00	9	
13:30	8	
14:00	7	
14:30	10	

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
15:00	7	
15:30	9	
16:00	7	
16:30	8	
17:00	8	
17:30	7	
18:00	6	
18:30	8	
19:00	11	
19:30	7	
20:00	9	
20:30	10	
21:00	9	
21:30	10	
22:00	10	
22:30	9	
23:00	10	
23:30	10	
0:00	9	

Selasa Tanggal 09-03-2021

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
0:30	6	
1:00	8	
1:30	7	
2:00	10	
2:30	8	
3:00	7	
3:30	6	
4:00	9	
4:30	7	
5:00	8	8.1041
5:30	6	
6:00	8	
6:30	8	
7:00	7	
7:30	8	
8:00	9	
8:30	7	
9:00	9	
9:30	8	

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
10:00	9	
10:30	10	
11:00	9	
11:30	9	
12:00	10	
12:30	9	
13:00	8	
13:30	10	
14:00	12	
14:30	10	
15:00	9	
15:30	8	
16:00	8	
16:30	9	
17:00	8	
17:30	7	
18:00	9	
18:30	8	
19:00	11	
19:30	8	
20:00	7	
20:30	8	
21:00	7	
21:30	8	
22:00	6	
22:30	8	
23:00	6	
23:30	7	
0:00	5	

Rabu Tanggal 10-03-2021

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
0:30	10	
1:00	9	
1:30	7	
2:00	6	
2:30	10	8.6458
3:00	9	
3:30	7	
4:00	8	
4:30	7	

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
5:00	6	
5:30	7	
6:00	8	
6:30	7	
7:00	9	
7:30	9	
8:00	9	
8:30	10	
9:00	9	
9:30	10	
10:00	11	
10:30	11	
11:00	12	
11:30	12	
12:00	11	
12:30	10	
13:00	10	
13:30	11	
14:00	10	
14:30	8	
15:00	9	
15:30	9	
16:00	8	
16:30	7	
17:00	8	
17:30	7	
18:00	6	
18:30	9	
19:00	6	
19:30	8	
20:00	7	
20:30	8	
21:00	10	
21:30	11	
22:00	7	
22:30	9	
23:00	8	
23:30	8	
0:00	7	

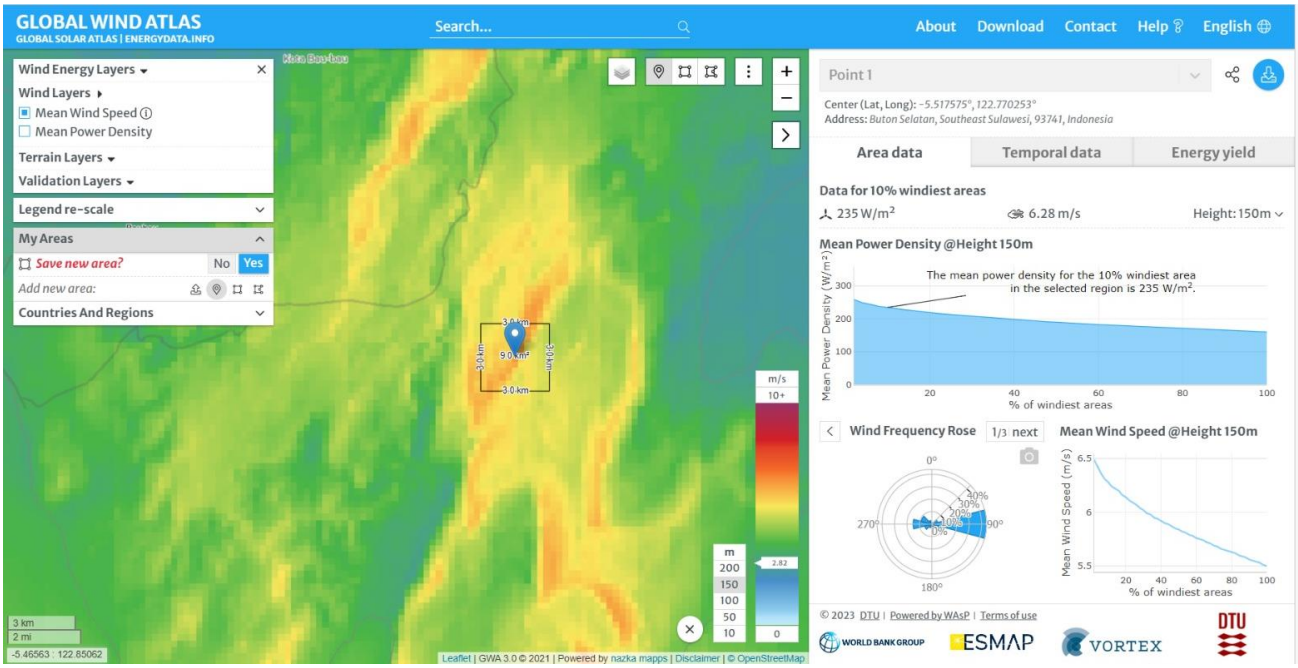
Kamis Tanggal 11-03-2021

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
0:30	7	
1:00	8	
1:30	9	
2:00	6	
2:30	8	
3:00	6	
3:30	7	
4:00	6	
4:30	8	
5:00	8	7.1428
5:30	7	
6:00	6	
6:30	7	
7:00	8	
7:30	8	
8:00	6	
8:30	7	
9:00	8	
9:30	7	
10:00	6	

Sabtu Tanggal 13-03-2021

Pukul	Kecepatan angin (m/s)	Rata-rata(m/s)
21:00	10	
21:30	9	
22:00	10	
22:30	11	10.5714
23:00	9	
23:30	11	
0:00	14	

3. Global Wind Atlas



Wind Speed

val	perc	sel_perc
6.49	1.65	2
6.42	4.13	4
6.36	5.79	6
6.31	8.26	8
6.28	9.92	10
6.24	12.4	12
6.22	14.05	14
6.2	15.7	16
6.16	18.18	18
6.14	19.83	20
6.11	22.31	22
6.09	23.97	24
6.07	25.62	26
6.04	28.1	28
6.02	29.75	30
5.99	32.23	32
5.98	33.88	34
5.95	36.36	36
5.94	38.02	38

5.92	39.67	40
5.9	42.15	42
5.89	43.8	44
5.87	46.28	46
5.85	47.93	48
5.84	49.59	50
5.82	52.07	52
5.81	53.72	54
5.79	56.2	56
5.78	57.85	58
5.76	60.33	60
5.75	61.98	62
5.74	63.64	64
5.72	66.12	66
5.71	67.77	68
5.69	70.25	70
5.68	71.9	72
5.66	74.38	74
5.65	76.03	76
5.64	77.69	78
5.63	80.17	80
5.62	81.82	82
5.6	84.3	84
5.59	85.95	86
5.58	87.6	88
5.56	90.08	90
5.55	91.74	92
5.54	94.21	94
5.53	95.87	96
5.51	98.35	98
5.5	100	100

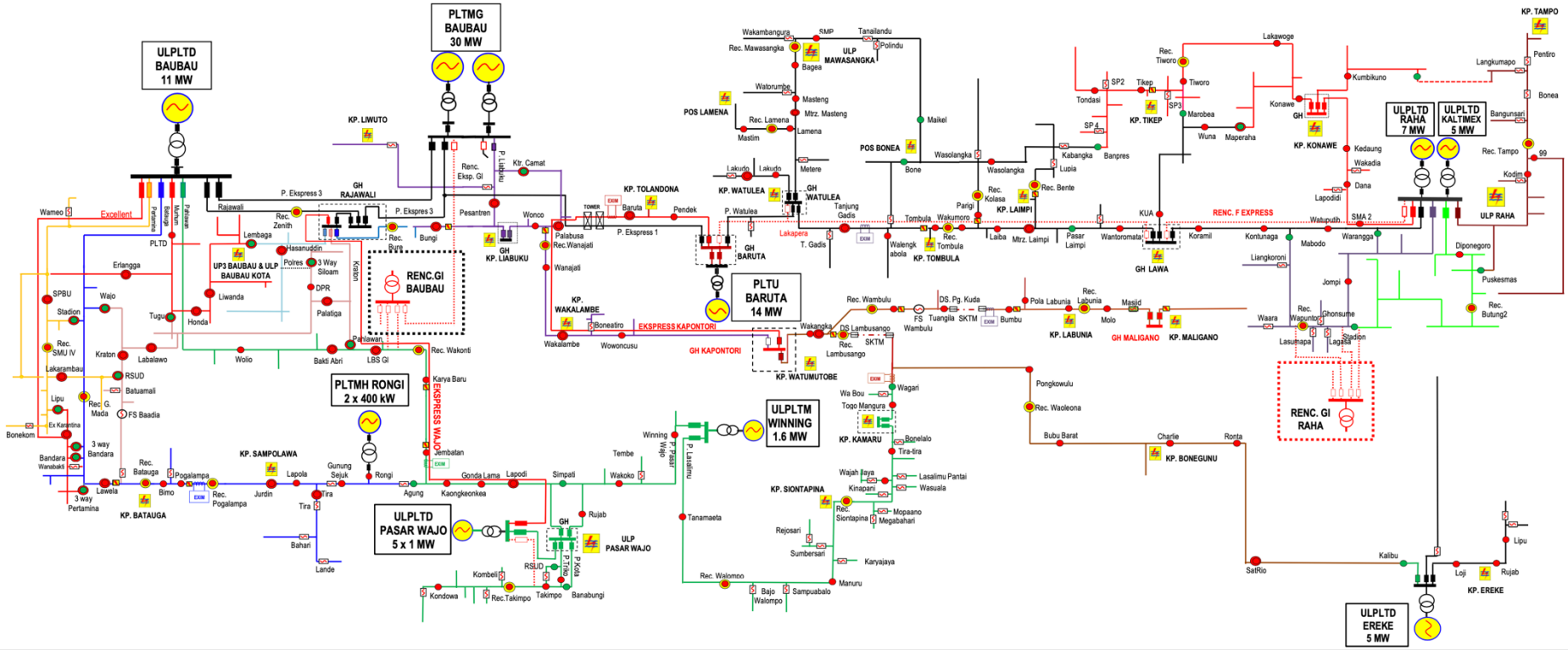
Dilakukan perhitungan pendekatan model data kecepatan angin menggunakan Rumus:

$$Vh = V\_ref \left(\frac{h}{h\_ref}\right)^{\alpha}$$

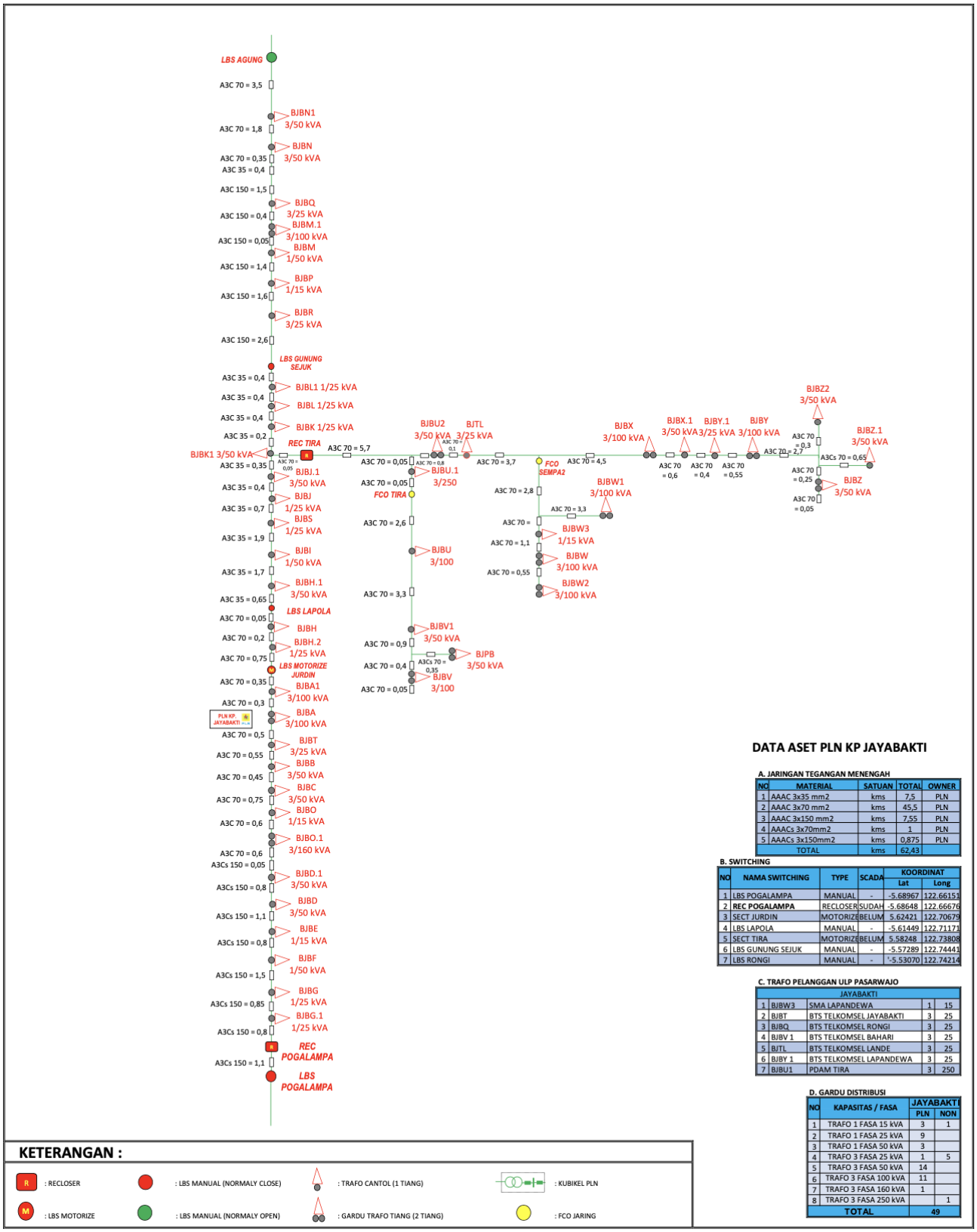
pukul	V_ref	h	h_ref	α	(h/h_ref)^ α	Vh
0	6.49	470	150	0.16	1.2005	7.791245
1	6.36	470	150	0.16	1.2005	7.63518
2	6.28	470	150	0.16	1.2005	7.53914
3	2.22	470	150	0.16	1.2005	2.66511
4	6.16	470	150	0.16	1.2005	7.39508
5	6.11	470	150	0.16	1.2005	7.335055
6	6.07	470	150	0.16	1.2005	7.287035
7	6.02	470	150	0.16	1.2005	7.22701
8	5.98	470	150	0.16	1.2005	7.17899
9	5.94	470	150	0.16	1.2005	7.13097
10	5.9	470	150	0.16	1.2005	7.08295
11	5.87	470	150	0.16	1.2005	7.046935
12	5.84	470	150	0.16	1.2005	7.01092
13	5.81	470	150	0.16	1.2005	6.974905
14	5.78	470	150	0.16	1.2005	6.93889
15	5.75	470	150	0.16	1.2005	6.902875
16	5.72	470	150	0.16	1.2005	6.86686
17	5.69	470	150	0.16	1.2005	6.830845
18	5.66	470	150	0.16	1.2005	6.79483
19	5.64	470	150	0.16	1.2005	6.77082
20	5.62	470	150	0.16	1.2005	6.74681
21	5.59	470	150	0.16	1.2005	6.710795
22	5.56	470	150	0.16	1.2005	6.67478
23	5.54	470	150	0.16	1.2005	6.65077
24	5.51	470	150	0.16	1.2005	6.614755

SINGLE LINE DIAGRAM SISTEM BAUBAU - RAHA - EREKE

Versi Juli 2020



5. Single line Diagram Trafo Feeder Batauga



KETERANGAN :

R : RECLOSER
: LBS MANUAL (NORMALY CLOSE)
: TRAFO CANTOL (1 TIANG)
: KUBIKEL PLN
M : LBS MOTORIZE
: LBS MANUAL (NORMALY OPEN)
: GARDU TRAFO TIANG (2 TIANG)
: FCO JARING

DATA ASET PLN KP JAYABAKTI

A. JARINGAN TEGANGAN MENENGAH

NO	MATERIAL	SATUAN	TOTAL	OWNER
1	AAAC 3x35 mm2	kms	7,5	PLN
2	AAAC 3x70 mm2	kms	45,5	PLN
3	AAAC 3x150 mm2	kms	7,55	PLN
4	AAACs 3x70mm2	kms	1	PLN
5	AAACs 3x150mm2	kms	0,875	PLN
TOTAL		kms	62,43	

B. SWITCHING

NO	NAMA SWITCHING	TYPE	SCADA	KOORDINAT	
				Lat	Long
1	LBS POGALAMPA	MANUAL	-	-5.68967	122.66151
2	**REC POGALAMPA**	RECLOSER	SUDAH	-5.68648	122.66676
3	SECT JURDIN	MOTORIZE	BELUM	5.62421	122.70679
4	LBS LAPOLA	MANUAL	-	-5.61449	122.71171
5	SECT TIRA	MOTORIZE	BELUM	5.58248	122.73808
6	LBS GUNUNG SEJUK	MANUAL	-	-5.57289	122.74441
7	LBS RONGI	MANUAL	-	-5.53070	122.74214

C. TRAFO PELANGGAN ULP PASARWAJO

	JAYABAKTI			
1	BJBW3	SMA LAPANDEWA	1	15
2	BJBT	BTS TELKOMSEL JAYABAKTI	3	25
3	BJBQ	BTS TELKOMSEL RONGI	3	25
4	BJBV 1	BTS TELKOMSEL BAHARI	3	25
5	BJTL	BTS TELKOMSEL LANDE	3	25
6	BJBY 1	BTS TELKOMSEL LAPANDEWA	3	25
7	BJBU1	PDAM TIRA	3	250

D. GARDU DISTRIBUSI

NO	KAPASITAS / FASA	JAYABAKTI	
		PLN	NON
1	TRAFO 1 FASA 15 kVA	3	1
2	TRAFO 1 FASA 25 kVA	9	
3	TRAFO 1 FASA 50 kVA	3	
4	TRAFO 3 FASA 25 kVA	1	5
5	TRAFO 3 FASA 50 kVA	14	
6	TRAFO 3 FASA 100 kVA	11	
7	TRAFO 3 FASA 160 kVA	1	
8	TRAFO 3 FASA 250 kVA		1
TOTAL		49	

6. Listing GA dan NSGA

```
%Persamaan Micro Grid 30A+1250B+4400/24C+700/24D=235
%A, B, C, D adalah kromosom GA
clc
clear
total_generation=100;
popsize=30;
P_BGA=0.1;
mutation_probability=0.8;
cromosome=[ ceil(rand(popsize,1)*10) round(rand(popsize,1)*10)
ceil(rand(popsize,1)*10) round(rand(popsize,1)*10)];
for gen=1:total_generation;

% initial
total_cost=((0/100)*cromosome(:,1)+((152.191357232237/100)*cromoso
me(:,2))+((fix(4400/24)/100)*cromosome(:,3))+((fix(700/24)/100)*cromo
some(:,4)-120));
%total_cost=(3*cromosome(:,1)+(125*cromosome(:,2))+(1*cromosome(:,
3))+(1*cromosome(:,4)-312));
objectif_func =abs(total_cost);
rata(gen)=sum(objectif_func)/popsize;
for in_sort0=1:1%(Popsize-1)
      for in_sort1=(in_sort0+1):popsize
         if objectif_func(in_sort0) > objectif_func(in_sort1)
            % tukar fitness
            Temp=objectif_func(in_sort0);
            objectif_func(in_sort0)=objectif_func(in_sort1);
            objectif_func(in_sort1)=Temp;
            Temp_Krom=cromosome(in_sort1,:);
            cromosome(in_sort1,:)=cromosome(in_sort0,:);
            cromosome(in_sort0,:)=Temp_Krom;
         end
      end
end

best_cromosome_percent=cromosome(1,:)
best_crom(gen,:)=cromosome(1,:);
av=mean(objectif_func);
obj=objectif_func(1)
curva(gen)=objectif_func(1);

%cromosome
%============================ Breeder
==================================%
baik=1;
```

```
   for indeks0=2:popsize
      bga=rand;
      if bga < P_BGA
         cromosome(indeks0,:)=cromosome(baik,:);
         objectif_func(indeks0)=objectif_func(baik);
         baik=1;
       end
      clear bga
   end
  clear baik bga;

fitness=zeros();
for iter = 1:popsize
   temp_fitness = (1/(objectif_func(iter)+1));
   fitness(iter)=temp_fitness;
end
clear iterr
total_fitness=sum(fitness);
prob=zeros();
for muter=1:popsize
   prob_temp=fitness(muter)/total_fitness;
   prob(muter)=prob_temp;
end
clear muter

%%%%%%%%%%%%%%%%%%%%%%  Roulete wheel
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

cumulatif(1)=prob(1);
for index=2:popsize
   cumulatif(index)=cumulatif(index-1)+prob(index);
end
clear index
Temp_Krom(1,:)=cromosome(1,:);
for indeks0=2:popsize
      seleksi_roulette=rand;
      indeks1=1;
      while seleksi_roulette > cumulatif(indeks1)
         indeks1=indeks1+1;
         cumulatif(indeks1);
      end
      Temp_Krom(indeks0,:)=cromosome(indeks1,:);
      clear seleksi_roulette indeks1
end
 cromosome=Temp_Krom;
```

```
%%%%%%%%%%%%%%%Mutasi%%%%%%%%%%%%%%%
%%%%%%%%%%%%
for i=2:size(cromosome,1)
   for j=1:size(cromosome,2)
      position=rand;
      if position<mutation_probability

            if j==1
               cromosome(i,j)=round((rand)*0);
            elseif j==2
               cromosome(i,j)=round((rand)*50);
            elseif j==3
               cromosome(i,j)=round((rand)*50);
            else
               cromosome(i,j)=1;
            end
      end
   end
end

end
plot(curva)
ylabel('objective function')
xlabel('no. of generation')

best_cromosome_percent=cromosome(1,:)
if cromosome(1,1) > 100 && cromosome(1,2) > 100 && cromosome(1,3)
> 100 && cromosome(1,4) > 100 && objectif_func(1) > 0
   not_recomended_please_re_run_obj = objectif_func(1)

else
   recomended_obj = objectif_func(1)
end
```